

Repair Manual Jetta Hybrid 2013 ➤

Direct Shift Gearbox

Edition 02.2019





List of Workshop Manual Repair Groups

Repair Group

00 - General, Technical Data

30 - Clutch

34 - Controls, Housing

35 - Gears, Shafts

39 - Final Drive, Differential



Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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00 – General, Technical Data

1 Identification

(Edition 02.2019)

K0059080521 - 01.31.2024

⇒ [“1.1 Transmission Identification”, page 1](#)

1.1 Transmission Identification

The “7-speed DSG® transmission 0CG” is installed in the Jetta from MY 11. Allocation. Refer to ⇒ [“4.2 Transmission/Engine Allocation”, page 14](#).



Note

The transmission code letters are also included on the vehicle data labels.

NDR - Transmission Code

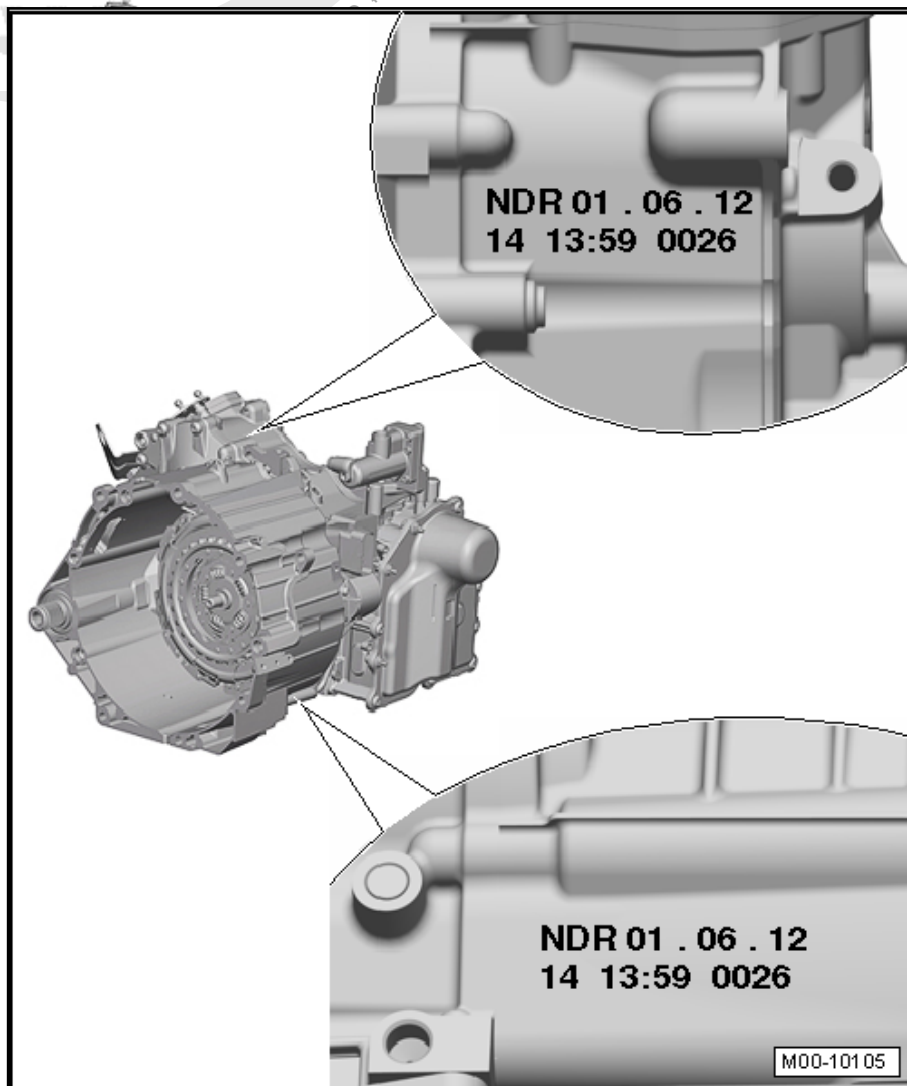
⇒ [“4.2 Transmission/Engine Allocation”, page 14](#)

01. 06.12 - Build date:
06/01/2013

14 - Plant Code

13:59 - Time

0026 - Serial Number





2 Safety Precautions

⇒ [“2.1 General Safety Precautions”, page 2](#)

⇒ [“2.2 High Voltage Vehicles Safety Precautions”, page 2](#)

⇒ [“2.3 Road Test with Testing Equipment Safety Precautions”, page 3](#)

⇒ [“2.4 Mechatronic Safety Precautions”, page 4](#)

⇒ [“2.5 Towing Notes”, page 5](#)

2.1 General Safety Precautions

To Avoid Injury and Damage to the Vehicle, Observe the Following:



WARNING

There is a risk of injury and accident from accidentally engaging a gear when the engine is running.

- ◆ *Move the selector lever into “P” and set the parking brake before working on a running engine.*

Observe the following to Prevent Personal Injury and Damage to the Electrical/Electronic Components:

- ◆ Connect and disconnect test equipment only when the ignition is off.



Caution

Risk of damaging electronic components when disconnecting the battery.

- ◆ *Follow the steps when disconnecting the battery. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery, Disconnecting and Connecting .*

2.2 High Voltage Vehicles Safety Precautions



Note

Check with the importer if there are any questions regarding the titles “hybrid electrically instructed person”, “high voltage technician”, “high voltage expert” or the term hybrid system.

Before beginning work on the high voltage system, a high voltage technician must de-energize the high voltage system. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System, De-Energizing .

The procedures required for de-energizing the high voltage system are listed in “Working on the High Voltage System”. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System General Warnings .



WARNING

Beware of the danger of electrocution.

An electrical shock can result in death.

Follow the High Voltage System General Warnings. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System General Warnings .

- ◆ *A high voltage technician must de-energize the high voltage system before any work can be performed on the high voltage system or before any servicing work can be performed on the body. The table "de-energizing the high voltage system" lists all the work procedures for which this procedure is necessary. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; General Warnings When Working On The High Voltage System .*
- ◆ *Only hybrid electrically instructed persons may perform all work on a vehicle with a high voltage system. All work must be performed by a high voltage technician.*



WARNING

Handling the high voltage cables:

- ◆ *Do not lean on or set tools on the high voltage system or any of its components.*
- ◆ *When working near high voltage components and high voltage cables, do not use tools that generate heat or that have sharp edges.*
- ◆ *Do not weld, solder or use hot air or thermal adhesive equipment when working near high voltage components and cables because they are sources of heat.*
- ◆ *Do not excessively bend or flex high voltage cables.*
- ◆ *Always contact a high voltage technician if there are questions or if something is not clearly understood.*

2.3 Road Test with Testing Equipment Safety Precautions

Performing Road Tests While Using Testing Equipment:



WARNING

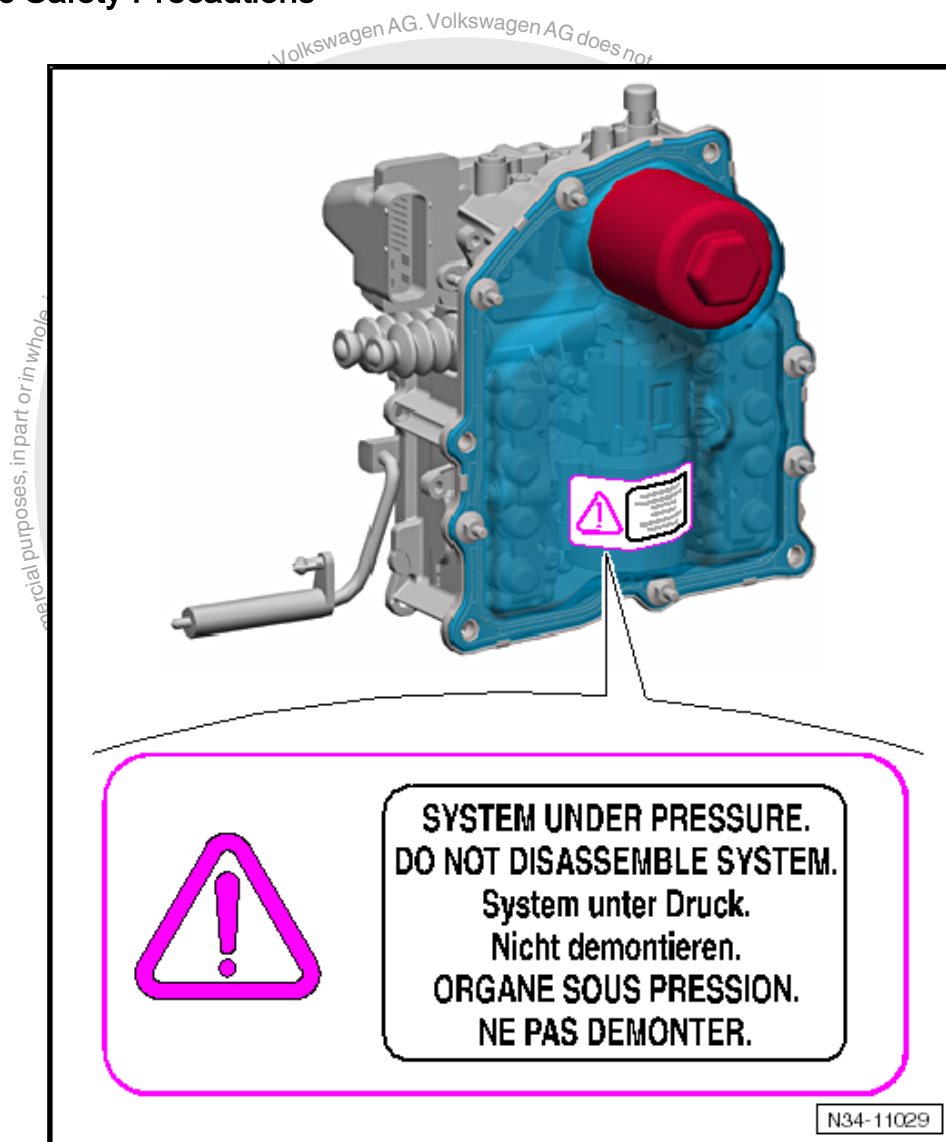
Distraction and testing equipment that is not secured properly can cause accidents.

The passenger airbag could pose a risk if it deploys in a collision.

- *Operating testing equipment while driving is a distraction.*
- *Testing equipment that is not secured probably increases the risk of injury.*
- ◆ *Always secure testers on the rear seat with a strap and have a second person on the rear seat operate them.*



2.4 Mechatronic Safety Precautions



WARNING

The system is under pressure.

- ◆ *The DSG Transmission Mechatronic - J743- has a pressure reservoir that can hold up to 60 bar (870 psi) pressure.*
- ◆ *The cover on the DSG Transmission Mechatronic - J743- and the pressure reservoir may not be opened.*



Note

The pressure reservoir holds a maximum pressure of 60 bar (870 psi). The pump software adjusts the pressure. The pump shuts off when this pressure is reached. The pump turns back on when the pressure falls below 42 bar (609 psi) caused by shifting. A pressure of up to approximately 75 bar (1087 psi) could be produced should the software be faulty. The pressure relief valve opens automatically when this pressure is reached.



2.5 Towing Notes



Caution

Danger of causing damage to the transmission.

- ◆ *When towing the vehicle, move the selector lever into "N". Do not tow the vehicle further than 50 km (31 miles) and do not drive faster than 50 km/h (31 mph).*



Note

It is not possible to tow-start the engine.





3 Repair Information

⇒ [“3.1 General Information”, page 6](#)

⇒ [“3.2 Guidelines for Clean Working Conditions”, page 8](#)

⇒ [“3.3 General Repair Information”, page 8](#)

⇒ [“3.4 Working with Tester”, page 10](#)

3.1 General Information

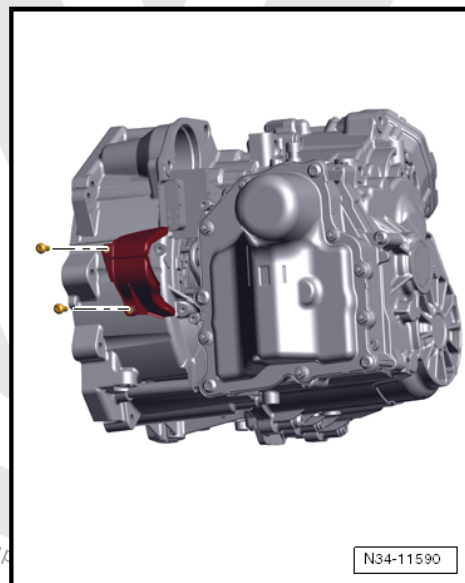
Transmission

- ◆ The Electro-Drive Drive Motor - V141- transfers the engine torque to the double clutch. The Electro-Drive Drive Motor - V141- and the dual clutch are connected via splines. The Electro-Drive Drive Motor - V141- has a disengagement clutch. The decoupler in Electro-Drive Drive Motor - V141- separates the internal combustion engine from the Electro-Drive Drive Motor - V141- .
- ◆ The transmission is built like a 7-speed manual transmission. The alternating hydraulic actuation of the two dry multi-plate clutches permits operation similar to that of an automatic transmission. This means the gears are automatically or manually shifted via the Tiptronic mode. Clutch pedal is not available.
- ◆ Both clutches are open when the ignition is off. 1st gear on sub-transmission 1 and reverse gear on sub-transmission 2 are engaged.

Some Vehicles Have A Cover Over the Engaging Levers.

The cover prevents dirt from getting in.

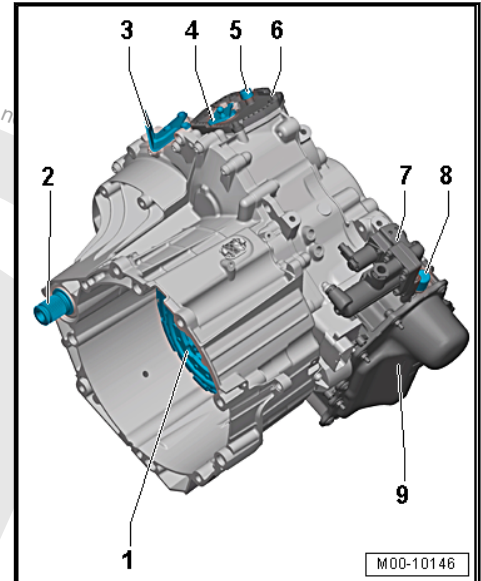
Bolt tightening specification: 8 Nm





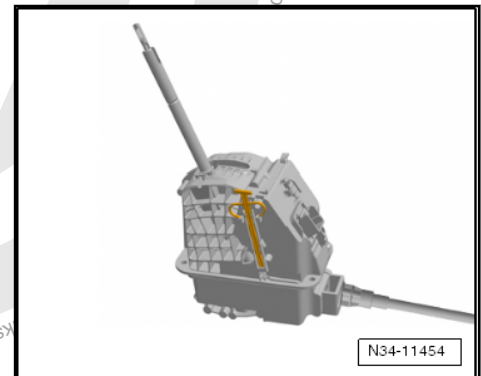
Transmission Assembly Overview

- 1 - Dual clutch
- 2 - Right Stub Shaft
- 3 - Cable Mounting Bracket
- 4 - Gearshift Lever
- 5 - Transmission ventilation cap
- 6 - Parking lock cover
- 7 - Valve block
- 8 - DSG Transmission Mechatronic - J743- Bleed Unit
- 9 - DSG Transmission Mechatronic - J743-



Selector Mechanism

In contrast to the automatic transmission, the selector lever position is no longer transmitted mechanically to the transmission via the selector lever cable and Multi-Function Transmission Range. Selector lever positions and shifts are transmitted via a separate control module in the selector mechanism to the transmission control module via the CAN-Bus. The shifter occurs without a cable. The selector lever cable is mechanically brought into the park brake in the selector lever position "P".



Transmission Fluid

The 7-speed DSG® transmission has two separate, different fluid systems. One for the transmission fluid -arrow A- and one for the hydraulic fluid -arrow B-.

Only transmission fluids specific to the DSG® transmission 0CG may be used. They are available as a replacement part. Using other oils can lead to function problems or can even cause the transmission to fail, for the specification. Refer to the Parts Catalog.

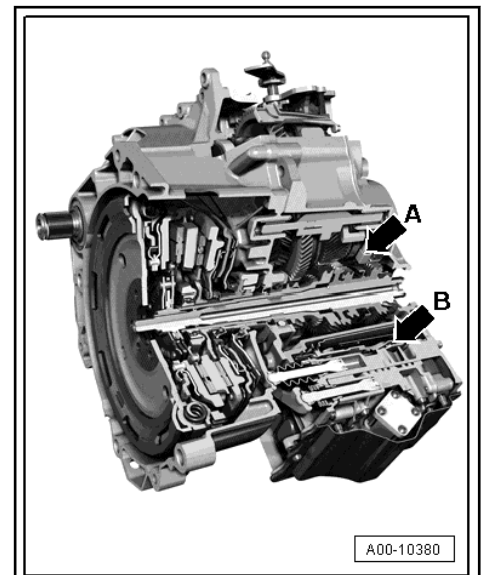
Do not mix any »additives« into the oil.

Do not re-use drained transmission fluid.



Caution

Be very careful when working with transmission fluid. Dispose of drained transmission fluid correctly.



It is not possible to check the transmission fluid level in the transmission. The only way to adjust the transmission fluid level is to replace the transmission fluid, for example, if the transmission is leaking fluid. Refer to ["9.1 Transmission Fluid, Draining and Filling", page 153](#).



3.2 Guidelines for Clean Working Conditions

- ◆ Always clean connection places and surrounding areas with engine or brake cleaner before loosening and dry cleaned places.
- ◆ Clean the transmission and transmission components using for example Cleaning Solution - D 009 401 04- .
- ◆ Use lint-free towels.
- ◆ Seal all open lines and connections immediately with new plugs from the Repair Kit - 5C0 998 152- . Refer to the Parts Catalog.
- ◆ Place removed parts on a clean surface and cover them. Use foil and paper. Use a lint-free cloth.
- ◆ Carefully cover or plug unpacked components if repairs cannot be performed immediately.
- ◆ Only install clean components: Remove the replacement parts from their packaging just prior to installing them.
- ◆ Protect the disconnected connectors from dirt and moisture and only connect when they are dry.
- ◆ Make sure no dirt can get into the transmission when it is open.
- ◆ Do not run the engine when the cover is removed from the transmission or when there is no transmission fluid in the transmission. Do not tow the vehicle.
- ◆ Cover all opened components carefully if it necessary to perform a repair.

3.3 General Repair Information

- ◆ Carefulness, cleanliness and the correct tools are required for transmission repairs to be successful. The usual basic safety precautions also, naturally apply when carrying out vehicle repairs.
- ◆ Some general repair information that applies to several procedures throughout this manual is summarized here. They apply to this repair manual.

Guided Fault Finding, On Board Diagnostics (OBD) and Test Instruments

- ◆ Before servicing the transmission, determine as best as possible the cause of the fault using the Vehicle Diagnostic Tester in Guided Fault Finding, Vehicle Self-Diagnosis and Test Instruments.

The Guided Functions button and the Guided Fault Finding button offer various functions. Refer to ⇒ ["3.4 Working with Tester", page 10](#) .

Special Tools and Equipment

For a complete list of special tools used in the Repair Manual. Refer to Workshop Equipment and Special Tools.

Transmission

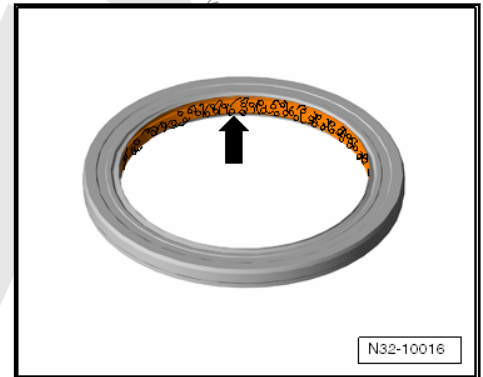
- ◆ Do not run engine or tow the vehicle when the oil pan is removed or when there is no transmission fluid.
- ◆ Always clean the connection locations and the area around them before loosening.



- ◆ During installation, make sure that the alignment bushings are fitted correctly.

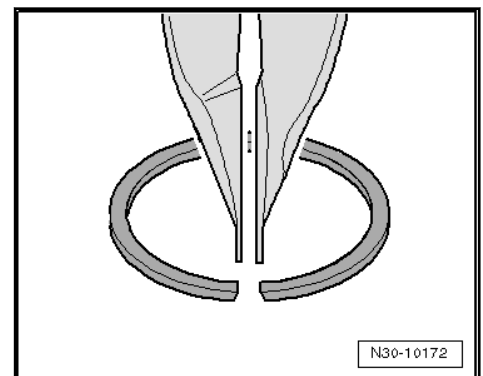
O-Rings, Gaskets, Seals

- ◆ O-rings, gaskets and seals must be replaced.
- ◆ Seals are also called shaft seals.
- ◆ After removing gaskets, examine contact surface on housing/shaft for burr resulting from removal or for other signs of damage.
- ◆ Clean the housing separating surface thoroughly before assembling.
- ◆ Lightly coat the seals with ATF along outer circumference and along the sealing lip.
- ◆ Coat O-rings with transmission fluid before inserting to prevent crushing rings during installation.
- ◆ Do not use any other lubricants in the gear oil area. Otherwise there is a danger of malfunction of the transmission hydraulics.
- ◆ The open side of the seals point toward the fluid to be sealed in.
- ◆ When installing the new shaft seals, make sure the sealing lip does not run on the same point as the sealing lip of the old seal (use insertion depth tolerances).
- ◆ Follow the guidelines for clean working conditions. Refer to [⇒ "3.2 Guidelines for Clean Working Conditions", page 8](#).



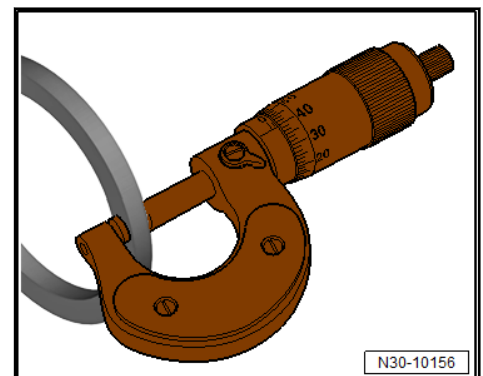
Fasteners

- ◆ Do not overstretch the circlips.
- ◆ Replace damaged or stretched circlips.
- ◆ The circlips must fit completely inside the groove.



Adjusting Shims

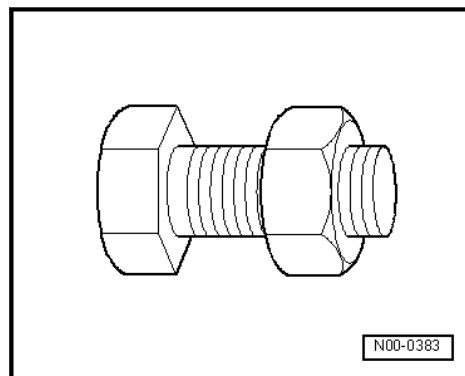
- ◆ Measure the shims at several locations with a micrometer caliper. It is possible to measure the necessary shim thickness by the different tolerances.
- ◆ Check for burrs and damage.
- ◆ Only install perfect shims.





Bolts and Nuts

- ◆ Loosen the bolts opposite the tightening sequence.
- ◆ Nuts and bolts which secure covers and housings should be loosened and tightened diagonally and in steps if no tightening sequence is specified.
- ◆ Replace the self-locking nuts.
- ◆ Use a wire brush to clean the threads of bolts that were screwed in with locking compound. Install the bolts with Locking Fluid - AMV 185 101 A1- .
- ◆ The tightening specifications stated apply to non-oiled nuts and bolts.



3.4 Working with Tester

- Use only Volkswagen Vehicle Diagnostic Testers .

The Guided Functions button and the Guided Fault Finding button offer various functions. The 3 most important functions are:

- ◆ Adapting installation information
- ◆ Reading measurements for mandatory reporting
- ◆ Performing basic measurement

Adapting Installation Information

The Mechatronic recognizes other control modules in the vehicle by signals from the Data bus. Pressing the Adapt Installation Information button tells the Mechatronic to forget all communication partners.

All active partners are recognized the next time the ignition is turned on.

Faults cannot be »created« with this function. Always use the Adapt Installation Information after the following tasks:

- ◆ After installing a gearshift mechanism.
- ◆ After a different control module is installed, for example, engine, ABS or Gateway.
- ◆ After working on the steering wheel paddle.

Reading Measurements for Mandatory Reporting

It is necessary to upload the measurements before contacting the Technical Service Center.

Save the measurements in the diagnostic log so that all the necessary transmission data is available for analyzing the faults.

Performing Basic Measurement.

This is how the Mechatronic learns the important settings. Also important adjustments are learned new or reset to the pre-programmed points. Among others, these are the synchronizing points and the corner points for the engaging lever and the gear selector.



WARNING

Do not perform a basic measurement without cause or without being requested.



- Press the J743 Perform Mechatronic Basic Measurement screen button only:
 - ◆ If the “Guided Fault Finding” requests it
 - ◆ After a fault stored in the Diagnostic Trouble Code (DTC) memory was corrected
 - ◆ After a dual clutch was installed
 - ◆ Or after a Mechatronic was installed





4 Technical Data

⇒ "4.1 Capacities", page 13

⇒ "4.2 Transmission/Engine Allocation", page 14

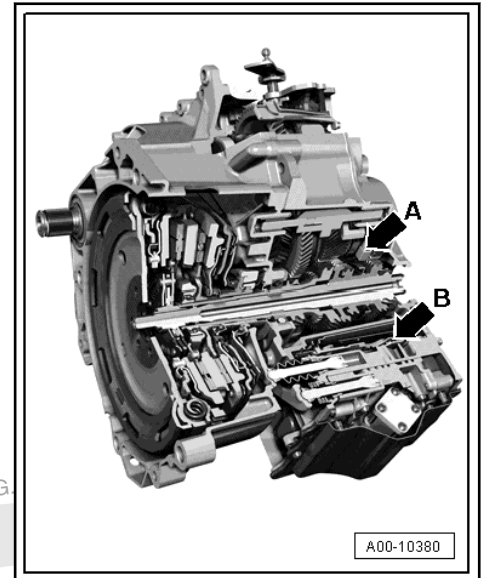
⇒ "4.3 Gear Ratio Calculation", page 15

4.1 Capacities

The 7-speed DSG transmission has two separate, different fluid systems. One for the transmission fluid -arrow A- and one for the hydraulic fluid -arrow B-.

Capacities	Transmission Fluid
Refill	Refer to Service References in Elsa2Go.
Change	No change required
Grease	Transmission fluid for DSG transmission 0CG . Refer to the Parts Catalog for the part number.

Capacities	Hydraulic fluid in DSG Transmission Mechatronic - J743-
Refill	Refer to Service References in Elsa2Go.
Change	Change not possible Checking the hydraulic fluid level for the DSG Transmission Mechatronic - J743- is not possible ¹⁾ .
Grease	Hydraulic oil . Refer to the Parts Catalog for the part number.



¹⁾ It is possible to fill hydraulic fluid via the Mechatronic vent.



Caution

Risk of damaging the transmission.

- ◆ **Use only the transmission fluid available as a replacement part for the 7-speed dual-clutch transmission OCG. Refer to the Parts Catalog.**
- ◆ **Using other fluids can cause malfunctions or transmission failure.**
- ◆ **Checking the hydraulic fluid level in the Dual-Clutch Transmission Mechatronic - J743- is not possible. The vent on the Dual-Clutch Transmission Mechatronic - J743- must be sealed tight before performing any assembly work.**
- ◆ **Hydraulic fluid that has leaked out of the Dual-Clutch Transmission Mechatronic - J743- may not be refilled.**
- ◆ **Seal off all openings with new plugs from the Repair Kit - 5C0 998 152- whenever the hydraulic line between the valve block on the Dual-Clutch Transmission Mechatronic - J743- and the connection for the decoupler for the Electric Drive Drive Motor - V141- is removed. After installing the hydraulic pipe, add hydraulic fluid via the vent for the Mechatronic, if necessary. Hydraulic fluid, sealing plugs and disposable syringe from the Repair Kit - 5C0 998 152-. Refer to the Parts Catalog.**
- ◆ **If transmission fluid has leaked out, then it is necessary to perform a transmission fluid replacement. It is not possible to check the fluid level.**
- ◆ **Underfilling or overfilling both fluid systems will impair the function of the transmission.**

4.2 Transmission/Engine Allocation

S tronic Transmission		OCG		
Transmission	Codes	NDR	PLC	PMY
Allocation	Type	Jetta from MY 2011	Jetta from MY 2011	Jetta from MY 2011
	Engine	1.4L TSI - 110 kW	1.4L TSI - 110 kW	1.4L TSI - 110 kW
Gear Ratios	Final drive I for 1st to 4th gear	71 : 16 = 4.438	71 : 16 = 4.438	71 : 16 = 4.438
Z ₂ : Z ₁	Final drive II for 5th gear and 6th gear	71 : 22 = 3.227	71 : 22 = 3.227	71 : 22 = 3.227
Z ₂ : Z ₁	Final drive III for 7th gear and reverse gear	71 : 17 = 4.176	71 : 17 = 4.176	71 : 17 = 4.176
Use the transmission code when ordering replacement parts for a repair. Refer to the Parts Catalog.				

S tronic Transmission		OCG		
Transmission	Codes	PWK	PZV	QHT
Allocation	Type	Jetta from MY 2011	Jetta from MY 2011	Jetta from MY 2011
	Engine	1.4L TSI - 110 kW	1.4L TSI - 110 kW	1.4L TSI - 110 kW
Gear Ratios	Final drive I for 1st to 4th gear	71 : 16 = 4.438	71 : 16 = 4.438	71 : 16 = 4.438



S tronic Transmission		0CG		
$Z_2 : Z_1$	Final drive II for 5th gear and 6th gear	$71 : 22 = 3.227$	$71 : 22 = 3.227$	$71 : 22 = 3.227$
$Z_2 : Z_1$	Final drive III for 7th gear and reverse gear	$71 : 17 = 4.176$	$71 : 17 = 4.176$	$71 : 17 = 4.176$
Use the transmission code when ordering replacement parts for a repair. Refer to the Parts Catalog.				

S tronic Transmission		0CG		
Transmission	Codes	REQ	RRC	
Allocation	Type	Jetta from MY 2011	Jetta from MY 2011	
	Engine	1.4L TSI - 110 kW	1.4L TSI - 110 kW	
Gear Ratios	Final drive I for 1st to 4th gear	$71 : 16 = 4.438$	$71 : 16 = 4.438$	
$Z_2 : Z_1$	Final drive II for 5th gear and 6th gear	$71 : 22 = 3.227$	$71 : 22 = 3.227$	
$Z_2 : Z_1$	Final drive III for 7th gear and reverse gear	$71 : 17 = 4.176$	$71 : 17 = 4.176$	
Use the transmission code when ordering replacement parts for a repair. Refer to the Parts Catalog.				

4.3 Gear Ratio Calculation

Example:

	7th Gear	Final drive
Drive gear	$ZG_1 = 49$	$ZA_1 = 17$
Driven gear	$ZG_2 = 32$	$ZA_2 = 71$

$i = Z_2 : Z_1$ (Z_1 = number of teeth on the drive gear, Z_2 = number of teeth on the driven gear)

i_G = gear ratio = $ZG_2 : ZG_1 = 32 : 49 = 0.653$

i_A = axle ratio = $ZA_2 : ZA_1 = 71 : 17 = 4.176$

i_{total} = total ratio = $i_G \times i_A = 0.653 \times 4.176 = 2.730$



5 Overview - Powertrain

⇒ "5.1 Overview - Powertrain, Front Wheel Drive", page 16

5.1 Overview - Powertrain, Front Wheel Drive

The 7-speed DSG transmission 0CG has 5 shafts. Two input shafts and three output shafts.

A1 - Input Shaft 1

A2 - Input Shaft 2

B1 - Output Shaft 1

B2 - Output Shaft 2

B3 - Output Shaft 3

C - Front Final Drive

K1 - Clutch 1

K2 - Clutch 2

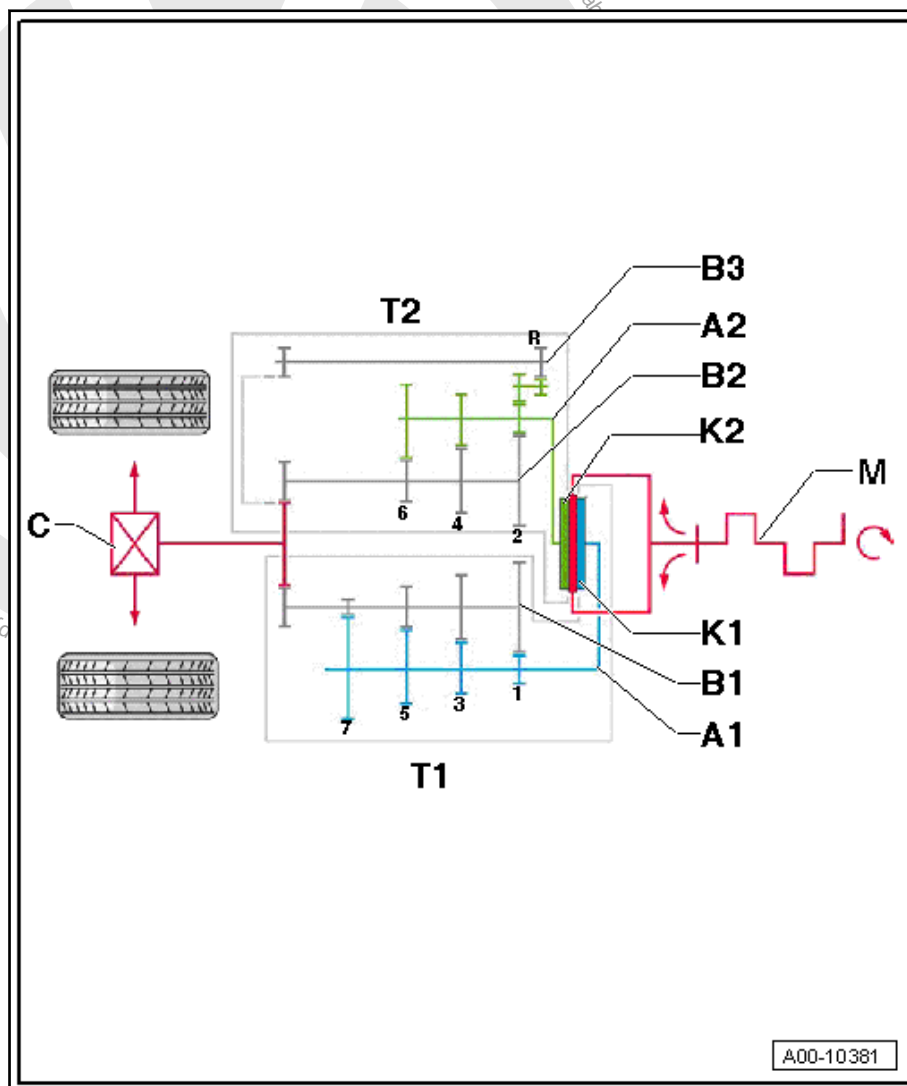
M - Engine

T1 - Sub-Transmission 1

- With 1st, 3rd, 5th and 7th gears

T2 - Sub-Transmission 2

- With 2nd, 4th, 6th and reverse gears





30 – Clutch

1 Clutch Mechanism

⇒ [“1.1 Overview - Clutch Engaging Mechanism”, page 17](#)

⇒ [“1.2 Clutch Engaging Mechanism, Removing and Installing”, page 19](#)

⇒ [“1.3 Clutch Engaging Mechanism, Adjusting”, page 22](#)

1.1 Overview - Clutch Engaging Mechanism





1 - Shim for "K 1"

- ❑ For determining thickness. Refer to ⇒ ["1.3 Clutch Engaging Mechanism, Adjusting", page 22](#) .

2 - Large Engaging Lever "K 1"

- ❑ With engaging bearing
- ❑ Removing and installing. Refer to ⇒ ["1.2 Clutch Engaging Mechanism, Removing and Installing", page 19](#) .

3 - Engaging Lever Support

- ❑ For the large engaging lever "K 1"
- ❑ Cannot be replaced

4 - Small Engaging Bearing for "K 2"

5 - Shim for "K 2"

- ❑ For determining thickness. Refer to ⇒ ["1.3 Clutch Engaging Mechanism, Adjusting", page 22](#) .

6 - Guide Sleeve Upper Section

- ❑ For the small engaging lever "K 2"
- ❑ Is removed and installed together with the small engaging lever and the guide sleeve lower section

7 - Small Engaging Lever for "K 2"

- ❑ Is removed and installed together with the guide sleeve upper section and lower section
- ❑ Removing and installing. Refer to ⇒ ["1.2 Clutch Engaging Mechanism, Removing and Installing", page 19](#) .

8 - Ball Stud

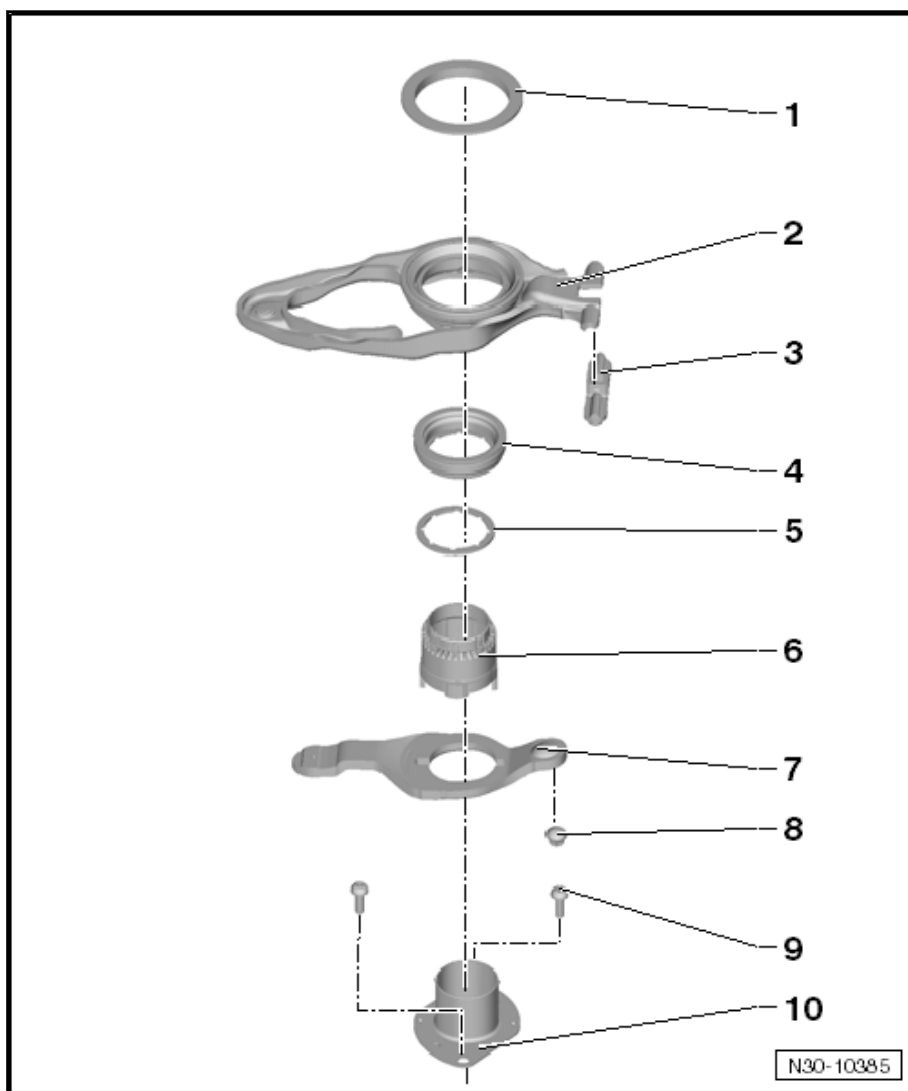
- ❑ For the small engaging lever "K 2"
- ❑ Removing and installing. Refer to ⇒ [page 23](#) .

9 - Bolt

- ❑ 8 Nm +90° turn
- ❑ Replace after removing

10 - Guide Sleeve Lower Section

- ❑ For the small engaging lever "K 2"
- ❑ Is removed and installed together with the small engaging lever and the guide sleeve upper section





1.2 Clutch Engaging Mechanism, Removing and Installing

Removing

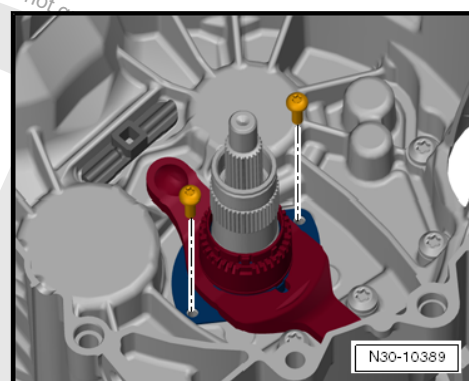
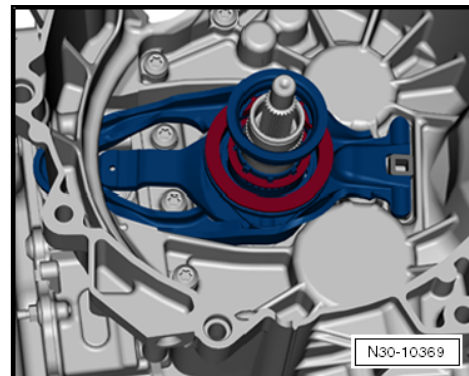
- The dual clutch is removed. Refer to ➔ [“2.2 DSG® Clutch, Removing”, page 37](#).
- Remove the large engaging lever with the small engaging bearing.



Note

The guide sleeve upper section cannot be removed or installed separately. It is always removed and installed together with the guide sleeve lower section and the small engaging lever.

- Remove the bolts and the small engaging lever with the guide sleeve upper and lower sections.





Replace the ball stud -2- only if it is worn down. Refer to [page 23](#).



WARNING

The hinge -1- cannot be removed.

Installing

Install in reverse order of removal. Note the following:



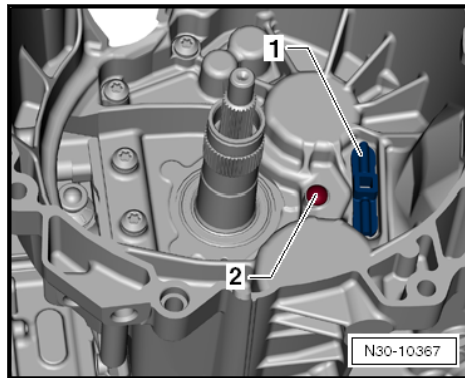
WARNING

It is necessary to adjust the position of the "K 1" and "K 2" engaging bearing after performing the following:

- ◆ *The dual clutch was replaced.*
- ◆ *The engaging levers were replaced.*
- ◆ *The ball stud for the "K 2" engaging lever was replaced.*
- ◆ *The engaging bearings were replaced.*

The hinge cannot be removed.

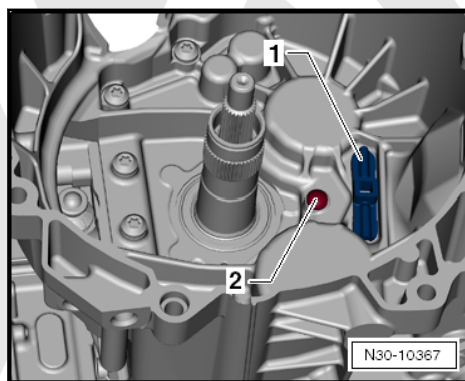
It is necessary to adjust the position of the "K 1 and K 2" engaging bearings first if one of the above mentioned procedures was performed. Refer to ["1.3 Clutch Engaging Mechanism, Adjusting"](#), page 22.



Note

It is not necessary to perform any adjustment if all the mentioned components are removed and installed again individually.

- The engaging lever support -1- and ball stud -2- are installed.
- Replace the ball stud -2- only if it is worn down. Refer to [page 23](#).





Note the Following When Installing A New Engaging Lever »K 2«:

A new engaging lever »K 2« with guide sleeve upper and lower sections are in their transportation position when they are delivered -illustration-. It is necessary to first move them into their installation position before installing them.

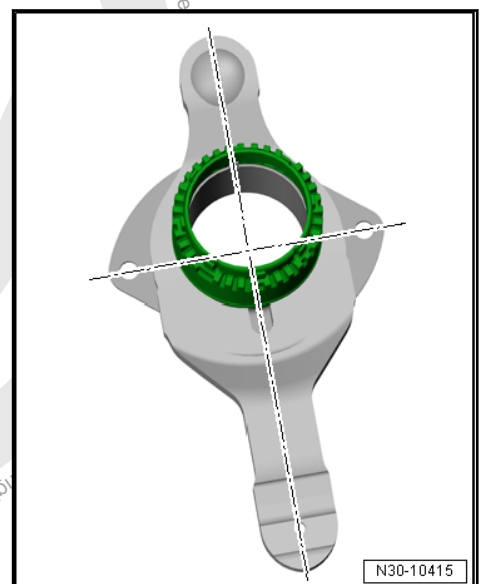
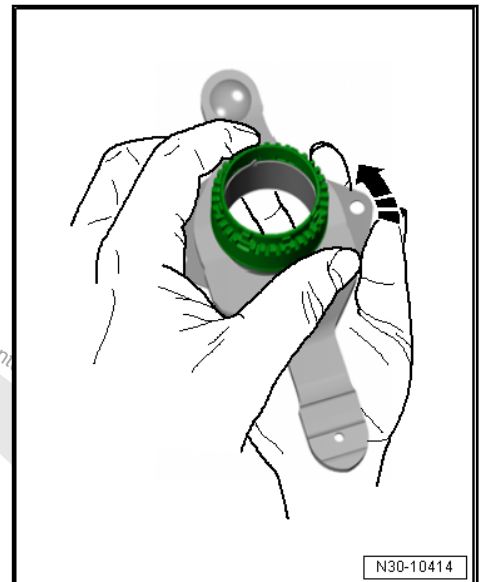
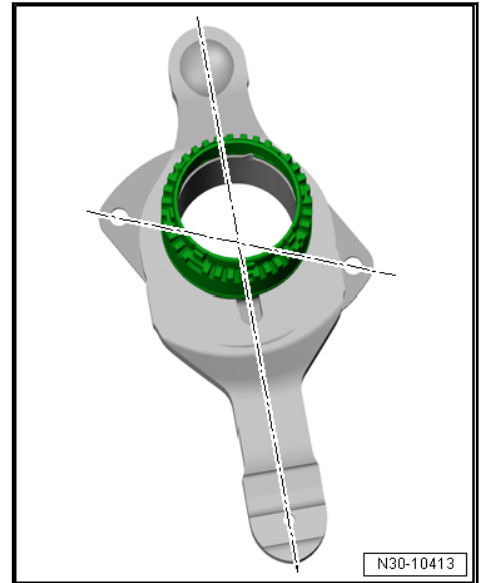
Bringing the engaging lever »K 2« into the installed position as follows:

- Hold the guide sleeve upper section with one hand. Turn the guide sleeve lower section in direction of -arrow- with the other hand until the sleeve moves freely.



Note

Hold both parts securely because a lot of force is needed to turn the guide sleeve lower section.



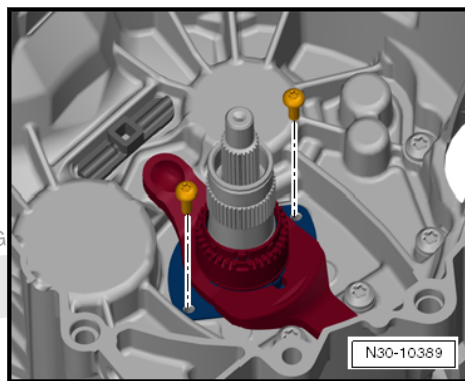
In the installed position, the holes in the guide sleeve lower section are at a right angle to the engaging lever and the sleeve can be moved freely.

- It is necessary to adjust the position of the engaging bearing "K 1" and "K 2" when installing a new engaging lever. Refer to ["1.3 Clutch Engaging Mechanism, Adjusting", page 22](#).

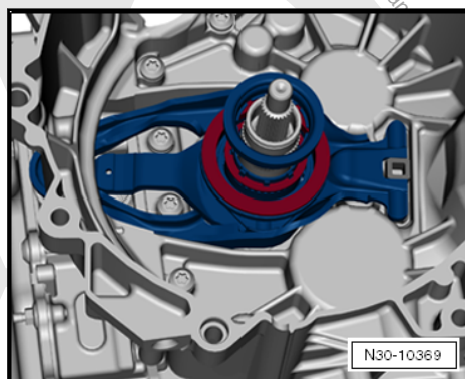


Continuation for All

- Install the small engaging lever with the upper and lower sections of the guide sleeve. Install new bolts and tighten them.

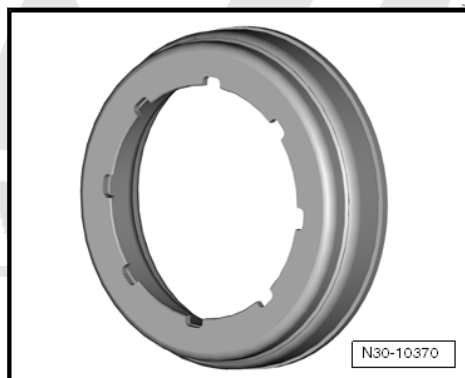


- Install the large engaging lever with the selected shims for “K 1” and “K 2” and with the small engaging bearing.
- The large shim in the large engaging bearing with the half-round side facing down.
- The small shim belongs under the small engaging bearing. Install the shim first.
- Insert the shim and the small engaging bearing in the installation position -8 grooves-.
- Turn and make sure the parts are installed correctly and fit correctly in the grooves.
- Make sure both engaging levers fit correctly.
- Install the dual clutch. Refer to ⇒ [“2.3 Dual Clutch, Installing”, page 41](#).



Tightening Specifications

- ◆ For the guide sleeve lower section together with the small engaging lever to transmission housing. Refer to ⇒ [“1.1 Overview - Clutch Engaging Mechanism”, page 17](#).



1.3 Clutch Engaging Mechanism, Adjusting

Special tools and workshop equipment required

- ◆ Digital Depth Gauge - 300mm - VAS6594-
- ◆ Gauge - Clutch Bearings - T10466-
- ◆ Ruler (2 pc.) - T40100-

It is necessary to adjust the position of the “K 1” and “K 2” engaging bearing after performing the following:

- ◆ The dual clutch was replaced.
- ◆ The engaging levers were replaced.
- ◆ The ball stud for the “K 2” engaging lever was replaced.
- ◆ The engaging bearings were replaced.



Note

- ◆ *It is not necessary to perform any adjustment if all the mentioned components are removed and installed again individually.*
- ◆ *The locking ring must be replaced in each case.*

Short Description

- ◆ The position of the engaging bearing is comparable to clutch play on a manual transmission. The engaging system in the 7-speed DSG® transmission 0CG and in the transmission itself have tolerances. There are also tolerances within the dual clutch. These tolerances must be taken into account separately when performing the adjustments.
- ◆ The following procedure describes how all necessary measurements are determined from the transmission side in order to select the correct shim. In addition to this, the tolerances in the dual clutch already determined by the manufacturer. The transmission side tolerances and the tolerances in the dual clutch determine the thickness of the shim.
- ◆ Follow the work sequence.

Procedure

- The dual clutch is removed. Refer to [⇒ "2.2 DSG® Clutch, Removing", page 37](#).
- The transmission flange must be even so that it has a good surface for the ruler.
- The DSG Transmission Mechatronic - J743- is installed in the transmission.



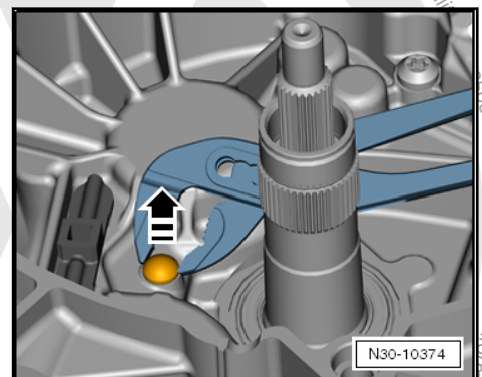
Caution

Danger of damaging the dual clutch and other components.

- ***The mount for the engaging lever and the entire mechanical system for the engaging bearing must be dry and free from oil and grease.***

If Ball Stud Is Worn Down

- Remove the ball stud using pliers.



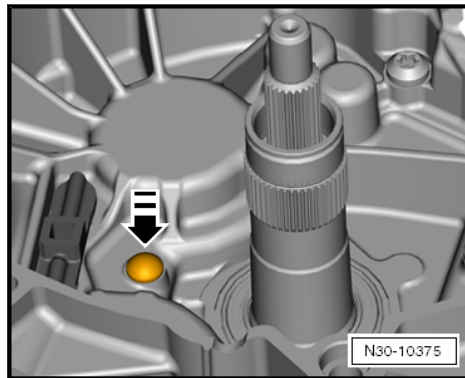


- Install the new ball stud by hand. Use a plastic hammer and drift gently, if necessary.



Note

Tap the drift with the plastic hammer gently to avoid damaging the ball stud.



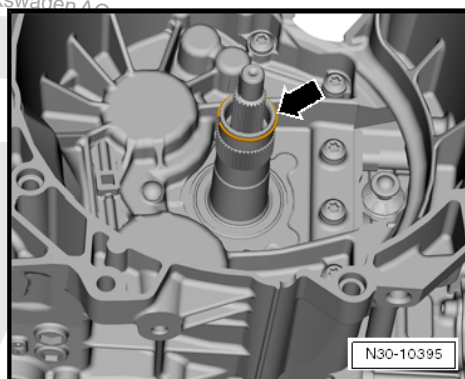
Continuation for All



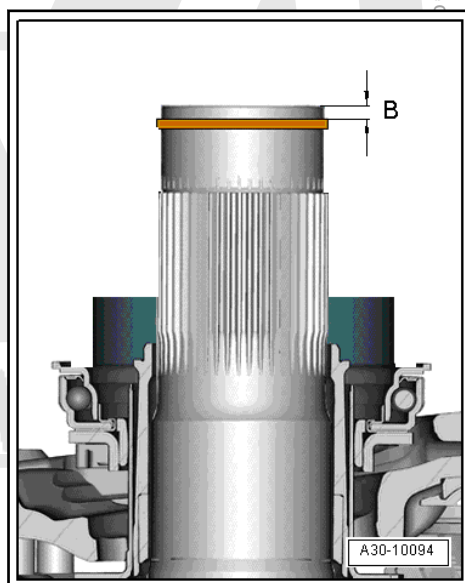
Note

If dimension "B" was already measured, then step "2" of the measurement can be made now. Refer to ⇒ [page 26](#).

- Install the previous locking ring -arrow- for the outer input shaft.



Step 1: Measure Dimension "B" for Clutch "K 1" and "K 2".



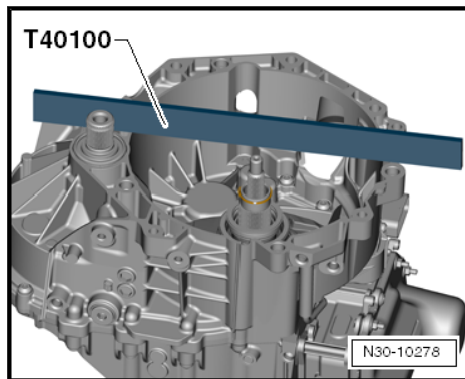
- Place Ruler (2 pc.) - T40100- across the end of the shaft on the transmission flange.



Caution

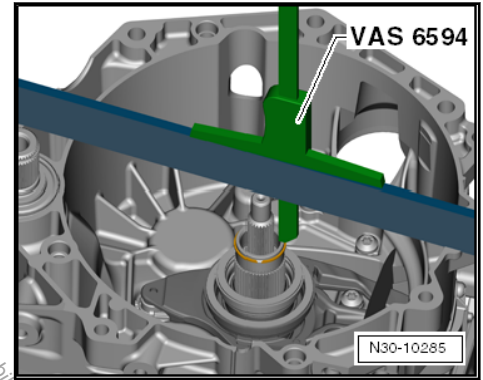
There is the risk of incorrect measurements.

- ♦ *The Ruler (2 pc.) - T40100- should stay in this position for the following measurements. Do not move it or take it off.*

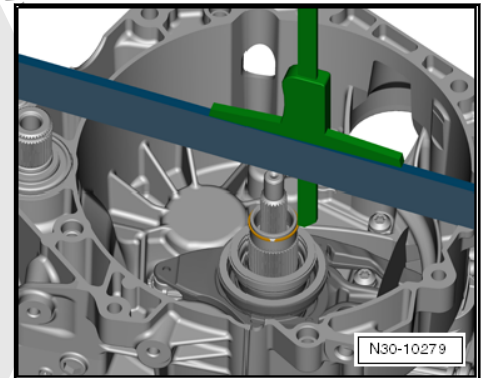




- Place the Digital Depth Gauge - 300mm - VAS6594- on top of the Ruler (2 pc.) - T40100- and position the depth slide on the outer input shaft.
- Set the depth gauge to “0”.



- Position the depth slide on the locking ring, as illustrated. Measure dimension “B₁” on the locking ring in this position.
- Example: measurement “B₁” = 2.62 mm



- Measure dimension “B₂” on the opposite side of the locking ring.



Note

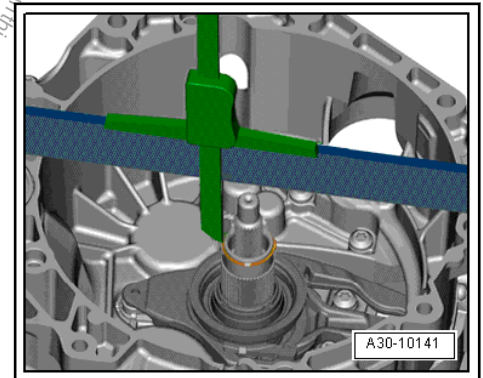
Do not measure on the end of the locking ring. The locking ring could get pushed away and this would invalidate the measurement.

- Example: dimension “B₂” = 2.58 mm
- Calculate the mean value from “B₁” and “B₂”.

Formula: $B_1 + B_2 : 2$

Example:

- $2.62 + 2.582 = 2.60$ mm
- Result: dimension “B” = 2.60 mm



Note

If the dual clutch is being installed according to this measurement, then it must be removed now. Refer to ➔ [page 40](#).

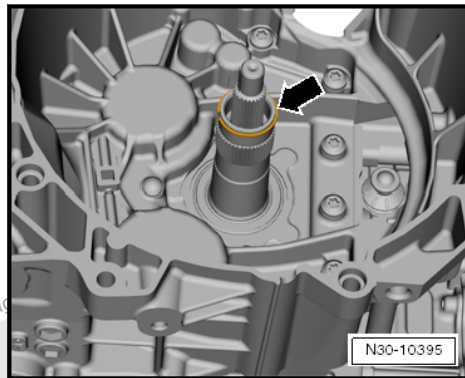


- Remove the locking ring -arrow- from the outer input shaft and throw it away.

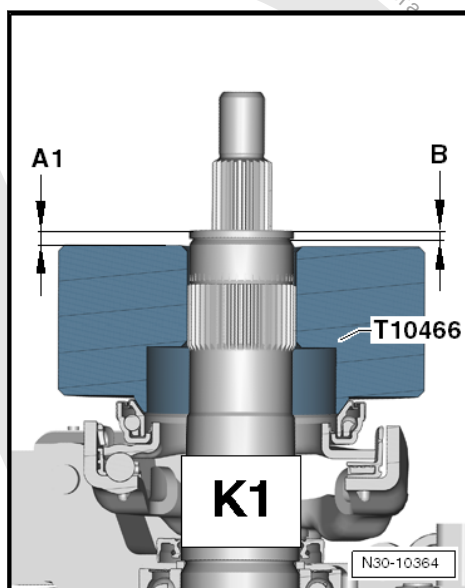


Caution

Do not re-use the locking ring.



Step 2: Measure Dimension "A 1" for the Clutch Engaging Bearing "K 1".



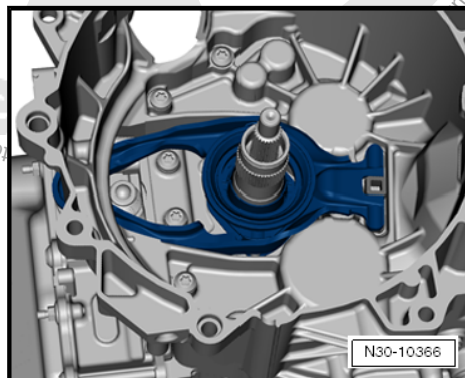
- Install the large engaging lever.



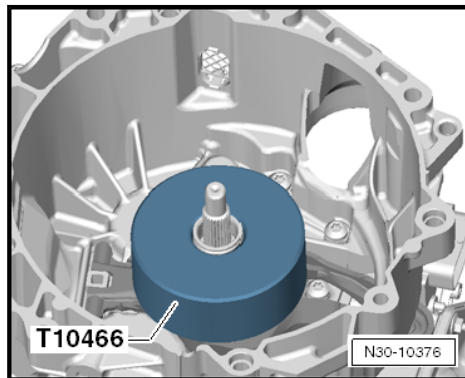
Caution

There is the risk of incorrect measurements.

- ◆ *Do not install the shim.*



- Make sure the engaging lever fits correctly.
- Place the Gauge - Clutch Bearings - T10466- on the large engaging bearing. The flat side faces up
- Press and turn the Gauge - Clutch Bearings - T10466- to make sure it seats correctly on the engaging bearing.
- The engaging bearing turns with the Gauge - Clutch Bearings - T10466- .





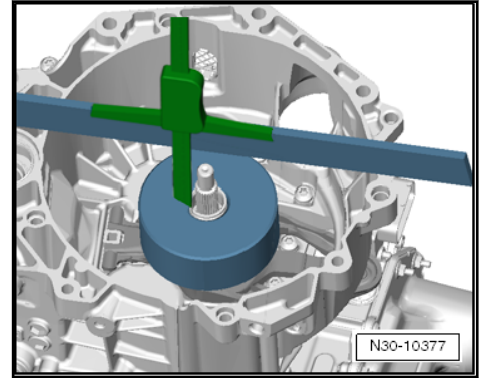
- Place the Digital Depth Gauge - 300mm - VAS6594- on top of the ruler and position the depth slide on the outer input shaft.
- The Ruler (2 pc.) - T40100- lies straight across the transmission flange over the end of the shaft.



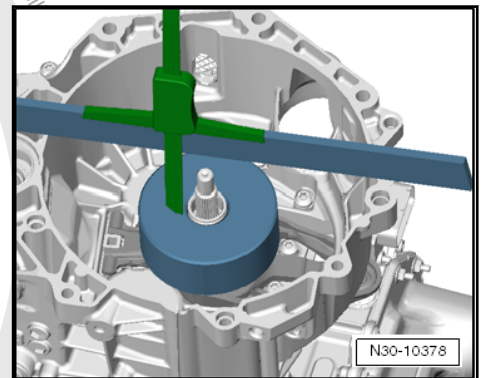
Caution

There is the risk of incorrect measurements.

- ◆ *The Ruler (2 pc.) - T40100- should stay in this position for the following measurements. Do not move it or take it off.*



- Set the depth gauge to "0".
- Position the depth slide on the Gauge - Clutch Bearings - T10466- , as illustrated.
- Measure dimension "A 1_a" on the Gauge - Clutch Bearings - T10466- .
- Example: measurement "A 1_a" = 5.03 mm





- Measure dimension “A 1_b” on the other side of the Gauge - Clutch Bearings - T10466- .
- Example: measurement “A 1_b” = 5.01 mm
- Calculate the average value from dimension “A 1_a” and “A 1_b”.

Formula: $A 1_a + A 1_b 2$

Example:

- $5.03 + 5.012 = 5.02$ mm
- Result: dimension “A 1” = 5.02 mm

Step 3: Measuring the Height Tolerance for the Engaging Bearing of Clutch “K 1”.



Note

Using dimension “A 1” and dimension “B”, calculate the height tolerance for clutch “K 1” engaging bearing as follows:

	Dimension “A 1”
–	Dimension “B”
=	Height tolerance for clutch “K 1” engaging bearing

Example:

- 5.02 mm - 2.60 mm = 2.42 mm
- Result: height tolerance for clutch “K 1” engaging bearing = 2.42 mm

Step 4: Measuring the Clutch Tolerance for Clutch “K 1”.

- Read the clutch tolerance value on the new clutch.
- Example: clutch tolerance read on the clutch “K 1” = $+0.2$ ”, as illustrated.
- Result: clutch “K 1” clutch tolerance = $+0.20$ mm.

Step 5: Measuring the Thickness of Shim “SK 1”.



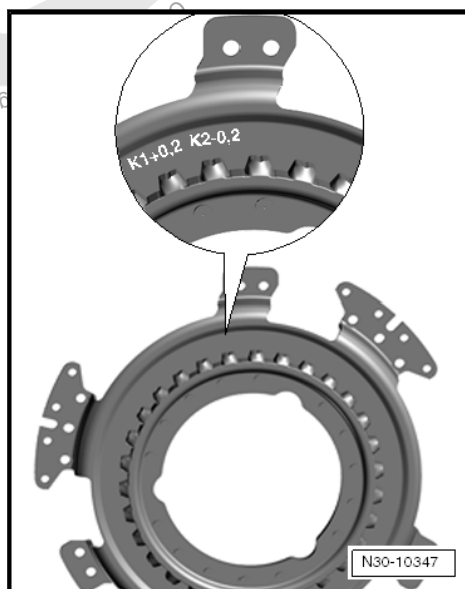
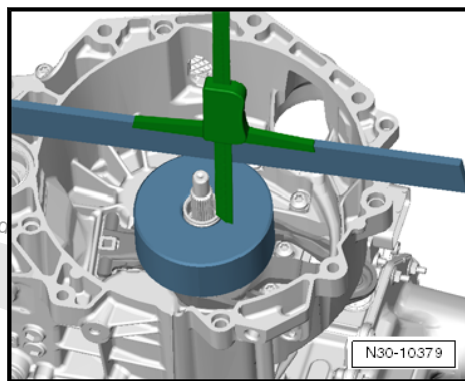
Note

Using the clutch tolerance of clutch “K 1”, now the thickness of shim “SK 1” can be calculated as follows:

	Height tolerance for the engaging bearing “K 1”
–/+	Clutch tolerance for clutch “K 1”
=	Calculated thickness for shim “SK 1”

Example:

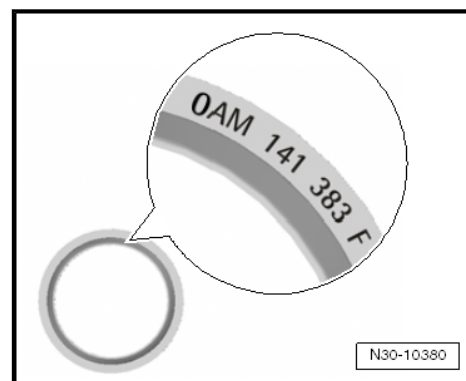
- 2.42 mm + 0.20 mm = 2.62 mm
- Result: calculated shim thickness “SK 1” = 2.62 mm





- Select the shim from the table using the part number -magnifying glass- on the shim and lay it nearby for installation.

Calculated Shim Thickness mm	Available Shim Thicknesses in mm	Shim Part Number
1.21 to 1.60	1.50	0AM 141 383
1.61 to 1.80	1.70	0AM 141 383 A
1.81 to 2.00	1.90	0AM 141 383 B
2.01 to 2.20	2.10	0AM 141 383 C
2.21 to 2.40	2.30	0AM 141 383 D
2.41 to 2.60	2.50	0AM 141 383 E
2.61 to 2.80	2.70	0AM 141 383 F
2.81 to 3.00	2.90	0AM 141 383 G
3.01 to 3.20	3.10	0AM 141 383 H
3.21 to 3.40	3.30	0AM 141 383 J
3.41 to 3.80	3.50	0AM 141 383 K



Example:

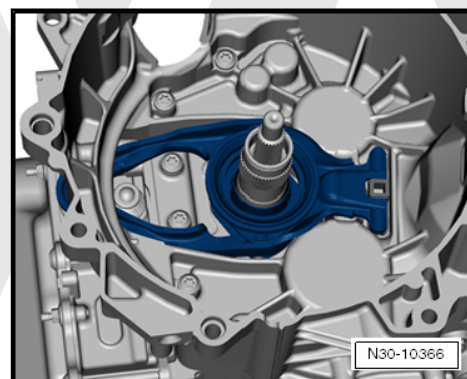
- Result: calculated shim thickness "SK 1" = 2.62 mm
- Selected shim thickness = 2.70 mm = part number 0AM 141 383 F

⚠ Caution

There is a risk of damaging the clutch.

◆ *Later installed only this shim.*

- Remove the Gauge - Clutch Bearings T10466- and large engaging lever.



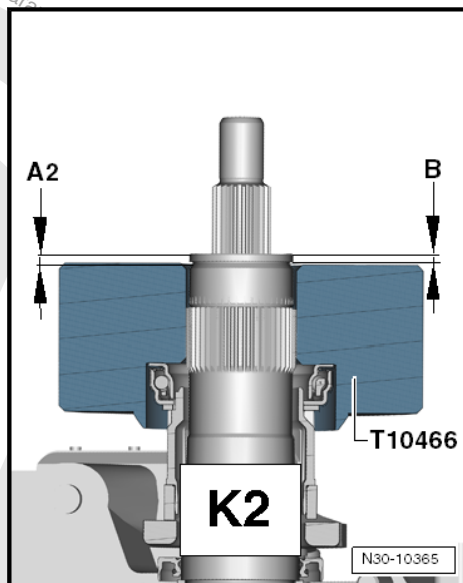


Step 6: Calculating Dimension "A 2" for Clutch "K 2" Engaging Bearing



Note

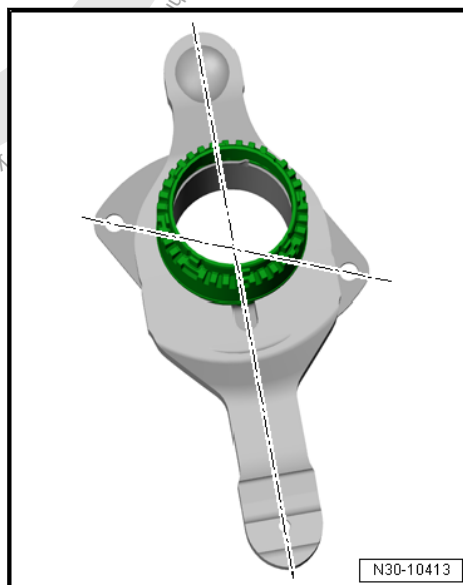
The guide sleeve upper section cannot be removed or installed separately. It is always removed and installed together with the guide sleeve lower section and the small engaging lever.



Note the Following When Installing A New Engaging Lever »K 2«:

A new engaging lever »K 2« with guide sleeve upper and lower sections are in their transportation position when they are delivered -illustration-. It is necessary to first move them into their installation position before installing them.

Bringing the engaging lever »K 2« into the installed position as follows:

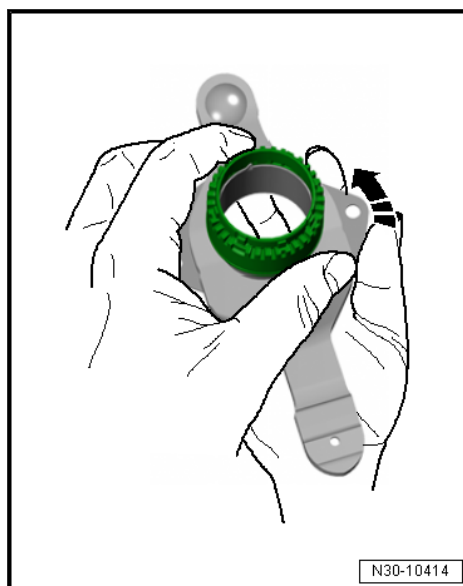


- Hold the guide sleeve upper section with one hand. Turn the guide sleeve lower section in direction of -arrow- with the other hand until the sleeve moves freely.



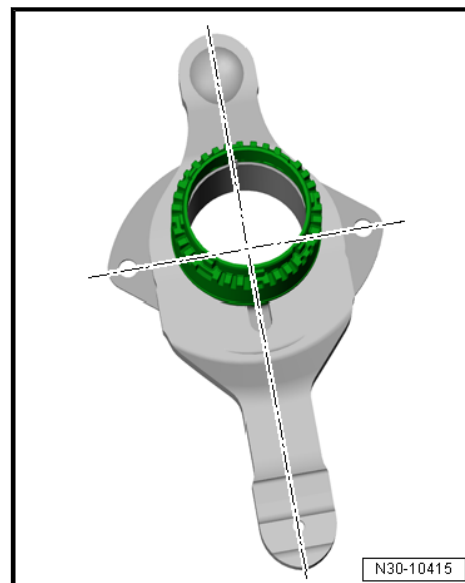
Note

Hold both parts securely because a lot of force is needed to turn the guide sleeve lower section.



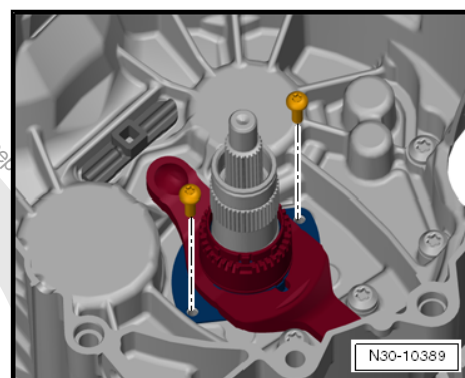


In the installed position, the holes in the guide sleeve lower section are at a right angle to the engaging lever and the sleeve can be moved freely.



Continuation for All

- Install the small engaging lever with the upper and lower sections of the guide sleeve. Install new bolts and tighten them.



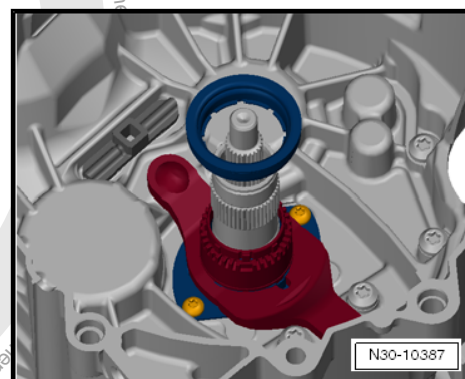
- Install the small engaging bearing without the shim.



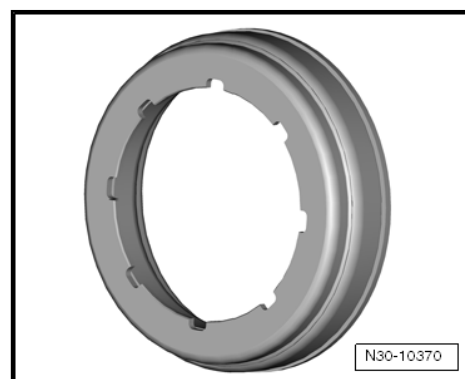
Caution

There is the risk of incorrect measurements.

◆ *Do not install the shim.*

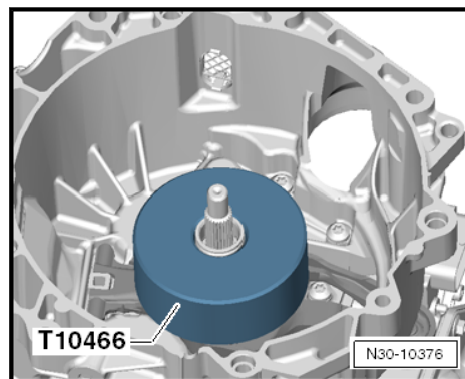


- The small engaging bearing fits in only one position due to the 8 grooves.
- Turn the small engaging bearing to make sure it is installed correctly and fits correctly in the grooves.

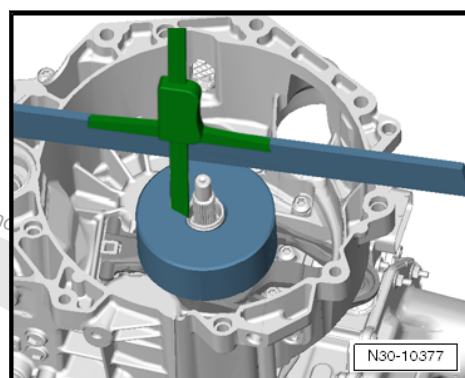




- Place the Gauge - Clutch Bearings - T10466- on the small engaging bearing. The flat side faces up
- Press and turn the Gauge - Clutch Bearings - T10466- to make sure it seats correctly on the engaging bearing.
- The engaging bearing turns with the Gauge - Clutch Bearings - T10466- .



- Place the Digital Depth Gauge - 300mm - VAS6594- on top of the ruler and position the depth slide on the outer input shaft.
- The Ruler (2 pc.) - T40100- lies straight across the transmission flange over the end of the shaft.

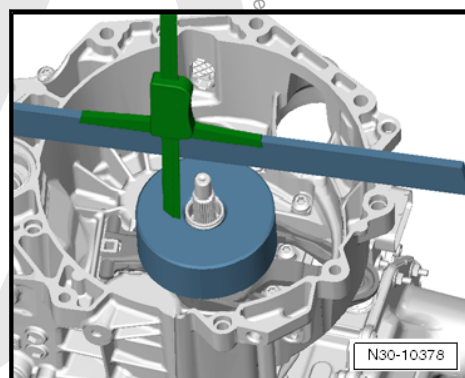


Caution

There is the risk of incorrect measurements.

- ◆ *The Ruler (2 pc.) - T40100- should stay in this position for the following measurements. Do not move it or take it off.*

- Set the depth gauge to "0".
- Position the depth slide on the Gauge - Clutch Bearings - T10466- , as illustrated.
- Measure dimension "A 2_a" on the Gauge - Clutch Bearings - T10466- .
- Example: dimension "A 2_a" = 4.79 mm





- Measure dimension “A 2_b” on the other side of the Gauge - Clutch Bearings - T10466- .
- Example: dimension “A 2_b” = 4.75 mm
- Calculate the average value from dimension “A 2_a” and “A 2_b”.

Formula: $A 2_a + A 2_b \div 2$

Example:

- $4,79 + 4,752 = 4.77$ mm
- Result: dimension “A 2” = 4.77 mm

Step 7: Measuring the Height Tolerance For the Engaging Bearing of Clutch “K 2”.



Note

Using dimension “A 2” and dimension “B”, calculate the height tolerance for clutch “K 2” engaging bearing as follows:

	Dimension “A 2”
–	Dimension “B”
=	Height tolerance for clutch “K 2” engaging bearing

Example:

- $4.77 \text{ mm} - 2.60 \text{ mm} = 2.17 \text{ mm}$
- Result: height tolerance for clutch “K 2” engaging bearing = 2.17 mm

Step 8: Measuring the Clutch Tolerance for Clutch “K 2”.

- Read the clutch tolerance value on the new clutch.
- Example: clutch tolerance read on the clutch “K 2” = – 0.2”, as illustrated.
- Result: clutch “K 2” clutch tolerance = – 0.20 mm.

Step 9: Measuring the Thickness of Shim “SK 2”.



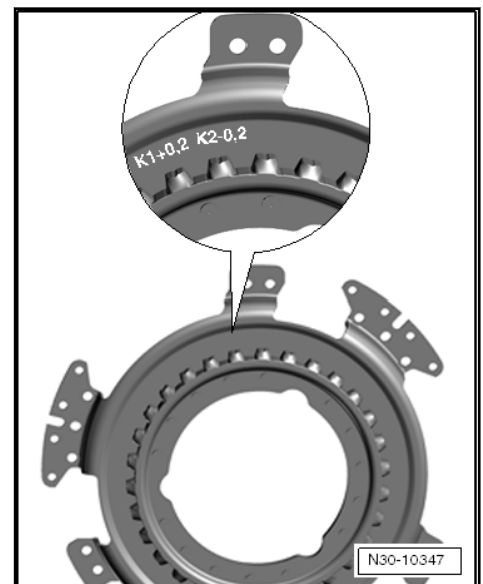
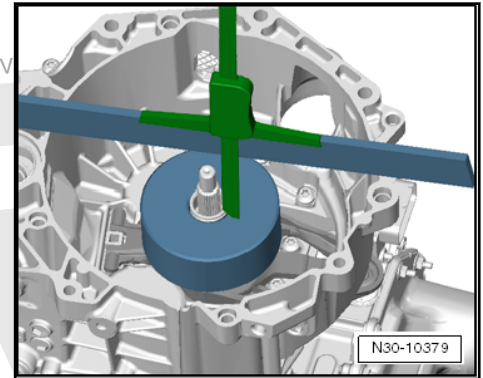
Note

Using the clutch tolerance of clutch “K 2”, now the thickness of shim “SK 2” can be calculated as follows:

	Height tolerance for the engaging bearing “K 2”
–/+	Clutch tolerance for the clutch “K 2”
=	Calculated thickness for shim “SK 2”

Example:

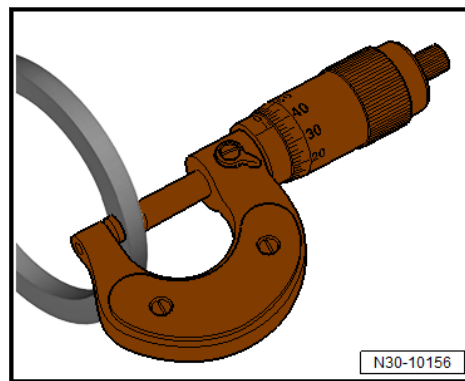
- $2.17 \text{ mm} - 0.20 \text{ mm} = 1.97 \text{ mm}$
- Result: calculated shim thickness “SK 2” = 1.97 mm





- Measure the needed shim from the shims supplied and keep it close for installation.

Calculated Shim Thickness mm	Available Shim Thicknesses in mm	Shim Part Number
0.31 to 0.90	0.80	WHT 005 518
0.91 to 1.10	1.00	WHT 005 518 A
1.11 to 1.30	1.20	WHT 005 518 B
1.31 to 1.50	1.40	WHT 005 518 C
1.51 to 1.70	1.60	WHT 005 518 D
1.71 to 1.90	1.80	WHT 005 518 E
1.91 to 2.10	2.00	WHT 005 518 F
2.11 to 2.30	2.20	WHT 005 518 G
2.31 to 2.50	2.40	WHT 005 518 H
2.51 to 2.70	2.60	WHT 005 518 J
2.71 to 3.30	2.80	WHT 005 518 K



Example:

- Result: calculated shim thickness “SK 2” = 1.97 mm
- Selected shim thickness = 2.00 mm



Caution

There is a risk of damaging the clutch.

- ◆ ***Later installed only this shim.***

The adjustment is now completed and the small engaging lever is already installed.

- Install the dual clutch. Refer to ⇒ [“2.3 Dual Clutch, Installing”, page 41](#) .

Tightening Specifications

- ◆ Guide sleeve lower section with small engaging lever to transmission housing. Refer to ⇒ [“1.1 Overview - Clutch Engaging Mechanism”, page 17](#) .



2 Clutch

⇒ [“2.1 Overview - Dual Clutch”, page 35](#)

⇒ [“2.2 DSG® Clutch, Removing”, page 37](#)

⇒ [“2.3 Dual Clutch, Installing”, page 41](#)

⇒ [“2.4 Input Shaft Seal, Replacing”, page 45](#)

⇒ [“2.5 Inner Input Shaft Seal, Replacing”, page 47](#)

2.1 Overview - Dual Clutch



Caution

Danger of causing damage to the dual clutch adjusting tool.

- ◆ ***The dual clutch is self-adjusting. Vibrations can affect the adjusting tool. Be careful not to drop the dual clutch into the transmission when installing.***
- ◆ ***Do not install a dual clutch that has fallen onto a hard surface or shows signs of damage.***



1 - Engaging Lever Support

- ❑ For the large engaging lever "K 1"
- ❑ Cannot be replaced

2 - Ball Stud

- ❑ For the small engaging lever "K 2"
- ❑ Removing and installing. Refer to ⇒ [page 23](#).

3 - Shim "SK 1"

- ❑ Selecting thickness. Refer to ⇒ ["1.3 Clutch Engaging Mechanism, Adjusting"](#), page 22.

4 - Shim "SK 2"

- ❑ Selecting thickness. Refer to ⇒ ["1.3 Clutch Engaging Mechanism, Adjusting"](#), page 22.

5 - Small Engaging Bearing for "K 2"

6 - Dual Clutch

- ❑ Removing. Refer to ⇒ ["2.2 DSG® Clutch, Removing"](#), page 37.
- ❑ Installing. Refer to ⇒ ["2.3 Dual Clutch, Installing"](#), page 41.

7 - Locking Ring

- ❑ Replace after removing

8 - Hub

9 - Locking Ring

- ❑ Replace after removing

10 - Large Engaging Lever "K 1"

- ❑ With engaging bearing
- ❑ Removing and installing. Refer to ⇒ ["1.2 Clutch Engaging Mechanism, Removing and Installing"](#), page 19.

11 - Guide Sleeve Upper Section

- ❑ For the small engaging lever "K 2"
- ❑ Is removed and installed together with the small engaging lever and the guide sleeve lower section

12 - Small Engaging Lever for "K 2"

- ❑ Is removed and installed together with the guide sleeve upper section and lower section
- ❑ Removing and installing. Refer to ⇒ ["1.2 Clutch Engaging Mechanism, Removing and Installing"](#), page 19.

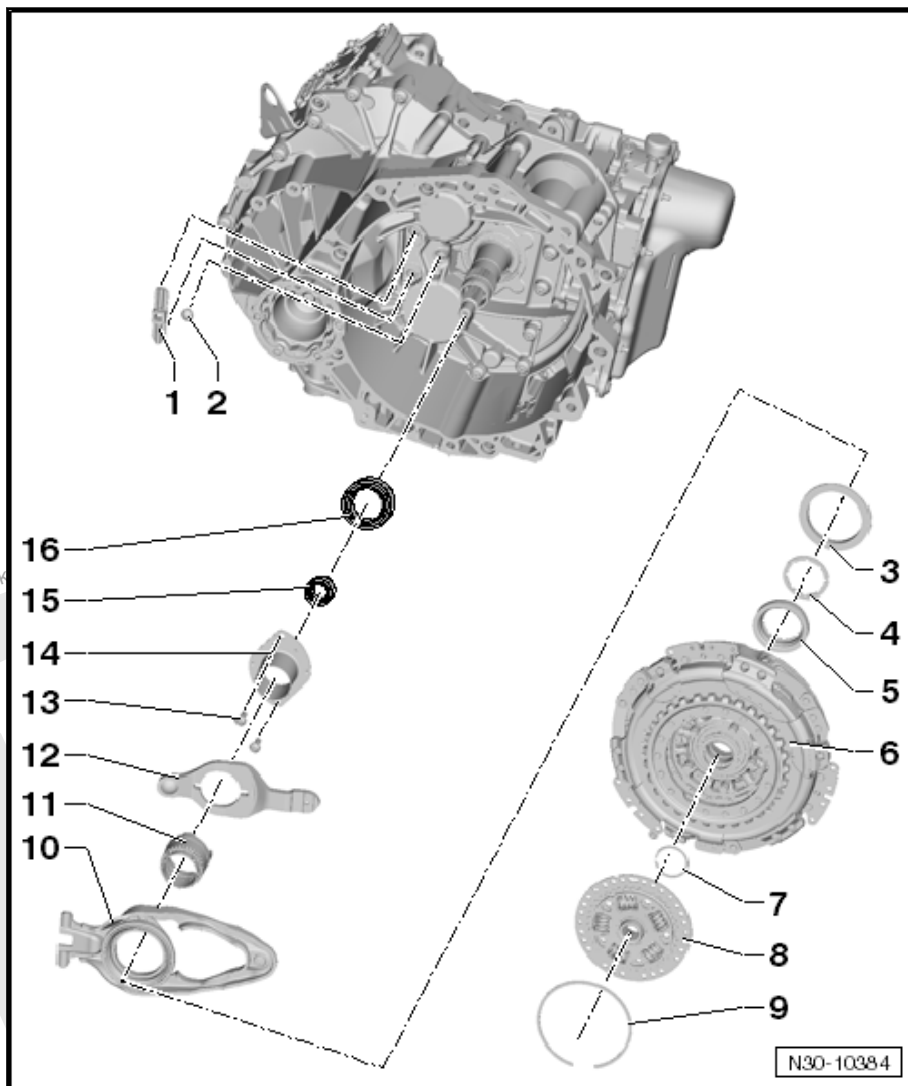
13 - Bolts

- ❑ 8 Nm +90° turn
- ❑ Replace after removing

14 - Guide Sleeve Lower Section

- ❑ For the small engaging lever "K 2"
- ❑ Is removed and installed together with the small engaging lever and the guide sleeve upper section

15 - Seal





- ❑ For the inner input shaft
- ❑ Refer to ➤ [“2.5 Inner Input Shaft Seal, Replacing”, page 47](#)

16 - Seal

- ❑ For the outer input shaft
- ❑ Replacing. Refer to ➤ [“2.4 Input Shaft Seal, Replacing”, page 45](#)

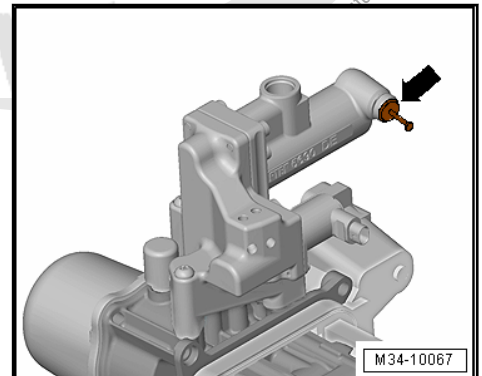
2.2 DSG® Clutch, Removing

Special tools and workshop equipment required

- ◆ T-Handle Hook - 3438-
- ◆ Engine Bung Set - VAS6122-
- ◆ Support Bridge - T10323-
- ◆ Subframe Bushing Assembly Tool Kit -Assembly Tool 5 - T10356/5- from the Subframe Bushing Assembly Tool Kit - T10356-
- ◆ Puller - Clutch - T10373-
- ◆ Clutch Press Piece - T10376-
- ◆ Protective Cap - 0AM 325 120 A- quantity 1 and Protective Cap - 02M 409 120- quantity 1, as an alternative to the Engine Bung Set - VAS6122-

Requirement

- The transmission is removed and mounted to the engine/transmission holder. Refer to ➤ [“8 Securing on Engine and Transmission Holder”, page 152](#) .
- The DSG Transmission Mechatronic - J743- is installed in the transmission.
- The connection on the valve block/Mechatronic is sealed with a new sealing plug -arrow- from the Repair Kit - 5C0 998 152- .





Removing

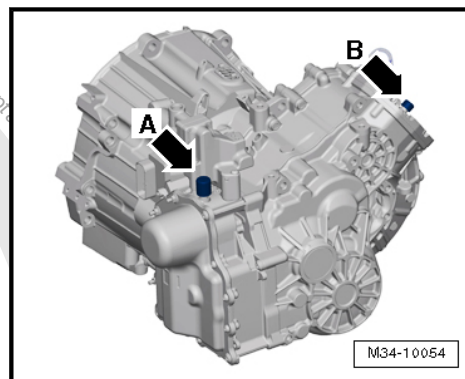


Caution

Danger of causing damage to the transmission.

The vent on the DSG Transmission Mechatronic - J743- (-arrow A-) and the transmission ventilation (-arrow B-) must be sealed tight so that no fluid can leak out.

- ◆ **Hydraulic fluid that has leaked out of the DSG Transmission Mechatronic - J743- may not be refilled. Checking the hydraulic fluid level in the DSG Transmission Mechatronic - J743- is not possible.**
- ◆ **Should hydraulic fluid leak out, it is possible to add new fluid using the vent on the Mechatronic. For the correct hydraulic fluid, sealing plugs and disposable syringe from the Repair Kit - 5C0 998 152- . Refer to the Parts Catalog. Perform the filling as soon as possible after installing the transmission in the vehicle. Dispose of the remaining hydraulic fluid and sealing plugs with the disposable syringe.**
- ◆ **If transmission fluid has leaked out, then it is necessary to perform a transmission fluid replacement. It is not possible to check the fluid level.**
- ◆ **Under filling or overfilling both fluid systems will impair the function of the transmission.**
- ◆ **The vent cap -arrow A- on the Mechatronic will get damaged when being removed and must be replaced.**



- Remove both caps -arrow A and B-.



Note

As an alternative to the Engine Bung Set - VAS6122- the Protective Cap - 02M 409 120- can be used to seal the transmission. The Protective Cap - 0AM 325 120 A- can also be used to seal the Mechatronic securely. Refer to the Parts Catalog.

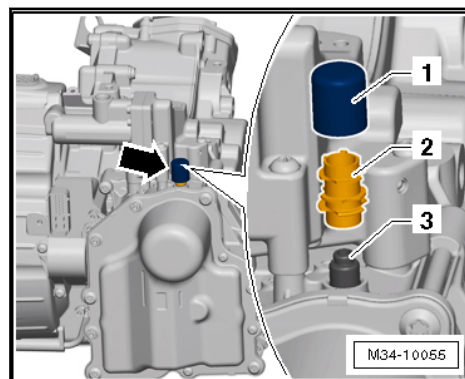
- Seal off the transmission ventilation on the DSG Transmission Mechatronic - J743- with clean plugs so that no fluid can leak out.
- Order a new cap -arrow- for the DSG Transmission Mechatronic - J743- . It must be replaced after installing the transmission. Refer to the Parts Catalog.



Note

The replacement vent -2- and cap -1- are a single component and is pushed onto the ventilation -3-.

- Remove the plugs after installing the transmission into the vehicle and re-install or replace the vent caps.



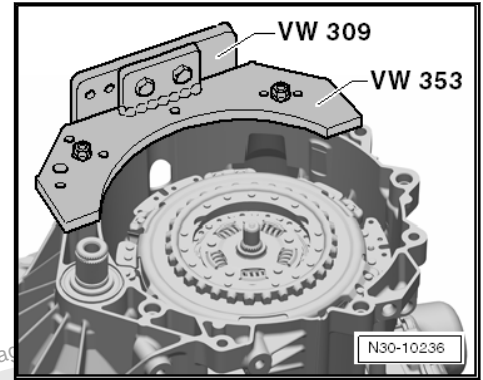


- Turn the transmission on the engine/transmission holder with the dual clutch facing up.

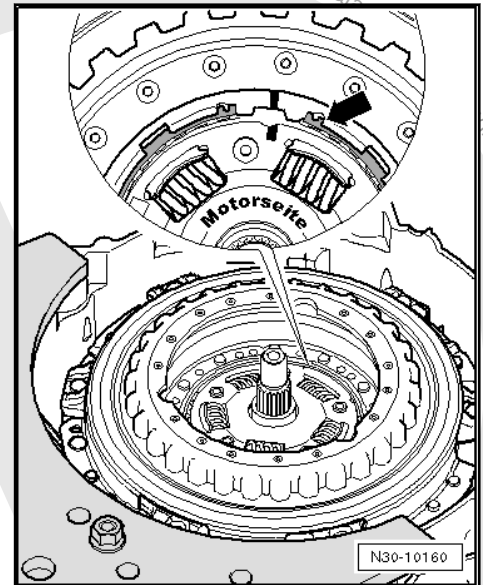


Note

The dual clutch is removed upward. The Mechatronic stays on the transmission.



- Remove the locking ring -arrow- from the hub.

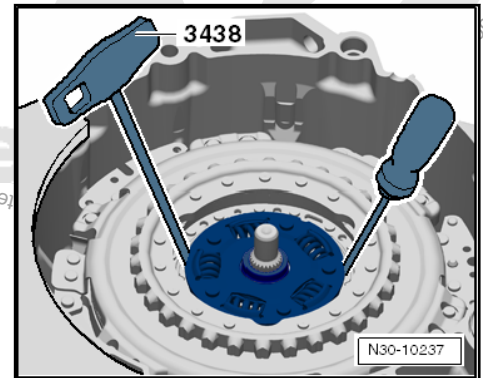


- Remove the hub using T-Handle Hook - 3438- and a screwdriver.



Note

It is necessary to adjust the position of the engaging bearings "K 1" and "K 2" later when dual clutch components are replaced. It is advisable to determine dimension "B" for the measurements. Refer to ⇒ ["1.3 Clutch Engaging Mechanism, Adjusting"](#), [page 22](#).





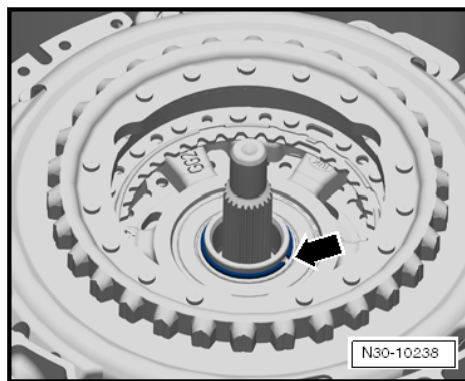
- Remove the locking ring -arrow- from the dual clutch.

If it is Not Possible to Remove the Locking Ring



Note

- ◆ *The dual clutch will »jam« the locking ring from underneath if it is not possible to remove the locking ring.*
- ◆ *If this is the case, then push the dual clutch slightly down as described in the following and this will release the pressure on the locking ring. Never hit the dual clutch or the shaft with a hammer.*
- ◆ *Always replace the locking ring.*

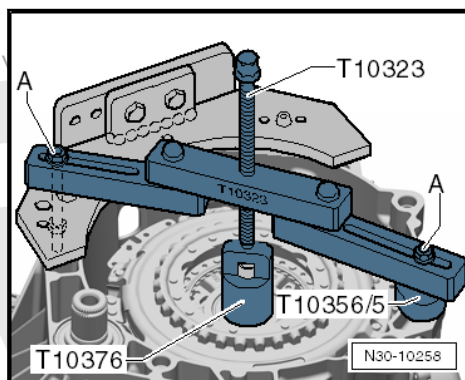


- Position the Support Bridge - T10323- parallel to the transmission flange, as illustrated.
- If necessary, even out the gaps, for example, with Subframe Bushing Assembly Tool Kit -Assembly Tool 5 - T10356/5- .
- Tighten the bolts -A- hand-tight.



Note

Secure the bolts -A- with a nut, if needed.



Caution

Danger of damaging the dual clutch and other components.

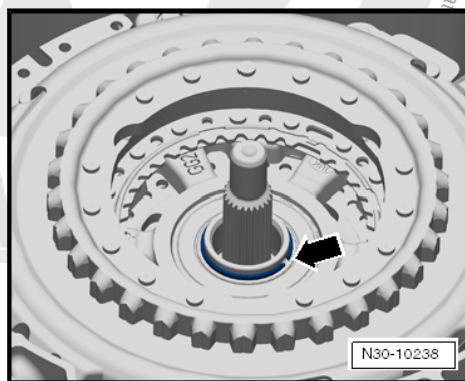
- ***Push the dual clutch down gently without pressing.***

- Turn the spindle against the Clutch Press Piece - T10376- to lower it.
- Remove the locking ring -arrow- from the dual clutch.



Caution

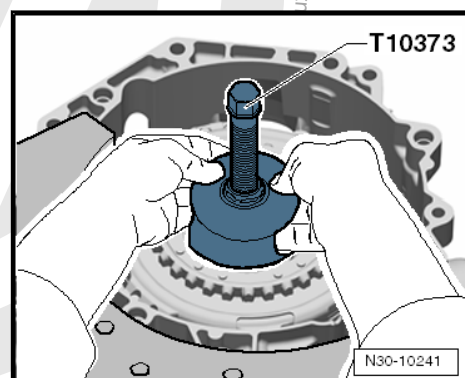
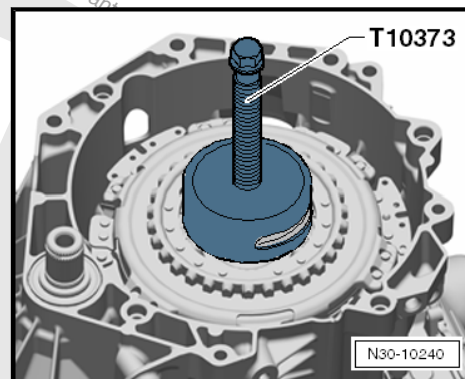
Do not re-use the locking ring.





Continuation for Removing the Locking Ring:

- Insert the Puller - Clutch - T10373- into the clutch and remove the clutch.
- Remove the dual clutch together with the Puller - Clutch - T10373- .



2.3 Dual Clutch, Installing

Special tools and workshop equipment required

- ◆ Support Bridge - T10323-
- ◆ Subframe Bushing Assembly Tool Kit -Assembly Tool 5 - T10356/5- from the Subframe Bushing Assembly Tool Kit - T10356-
- ◆ Puller - Clutch - T10373-
- ◆ Clutch Press Piece - T10376-



Installing



Caution

Danger of damaging the dual clutch and other components.

- ***The position of the engaging bearings must be adjusted correctly.***

Adjusting the engaging bearings can only be performed prior to installing the dual clutch.

The position of the engaging bearing must be adjusted after completing the following:

- ◆ ***The dual clutch was replaced.***
- ◆ ***The engaging levers were replaced.***
- ◆ ***The ball stud for the "K 2" engaging lever was replaced.***
- ◆ ***The engaging bearings were replaced.***

It is necessary to adjust the position of the "K 1 and K 2" engaging bearings first if one of the above mentioned procedures was performed. Refer to ⇒ ["1.3 Clutch Engaging Mechanism, Adjusting"](#), page 22.

Continue with assembling only when the adjustment is correct.

The removed shims can be used again if no new parts were installed.

Only one shim per engaging bearing can be installed.

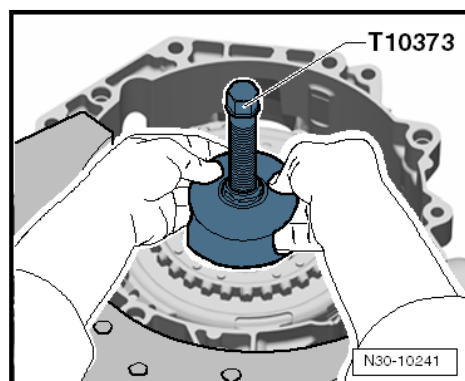
- ***Clutch components must have no oil or grease on them when being installed.***

Danger of causing damage to the dual clutch adjusting tool.

- ◆ ***The dual clutch is self-adjusting. Vibrations can affect the adjusting tool. Be careful not to drop the dual clutch into the transmission when installing.***

Requirement:

- The clutch engaging mechanism is installed. Refer to ⇒ ["1.2 Clutch Engaging Mechanism, Removing and Installing"](#), page 19.
- Turn back the spindle on the Puller - Clutch - T10373-.
- Install the dual clutch into the transmission using Puller - Clutch - T10373- , as illustrated.



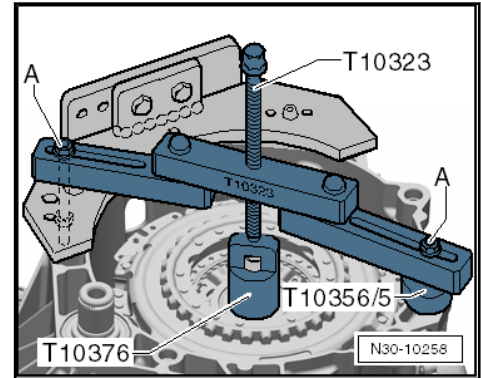


- Position the Support Bridge - T1032- parallel to the transmission flange, as illustrated.
- If necessary, even out the gaps, for example, using Sub-frame Bushing Assembly Tool Kit -Assembly Tool 5 - T10356/5- from the Subframe Bushing Assembly Tool Kit - T10356- .
- Tighten the bolts -A- hand-tight.



Note

Secure the bolts -A- with a nut, if needed.



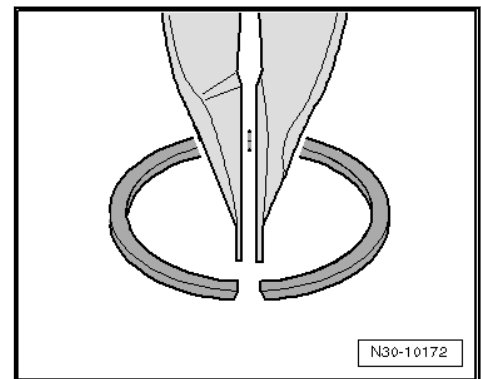
- Push on the dual clutch until it stops.



Note

Keep hand on the dual clutch while pressing it on. A slight »vibrating« should be felt. Vibrating means the dual clutch is being pushed onto its press-fit. It can also be felt when the dual clutch has reached its stop.

- Hold the new locking ring with locking ring pliers, as illustrated.
- Installed position: narrow ends of the locking ring at the top.

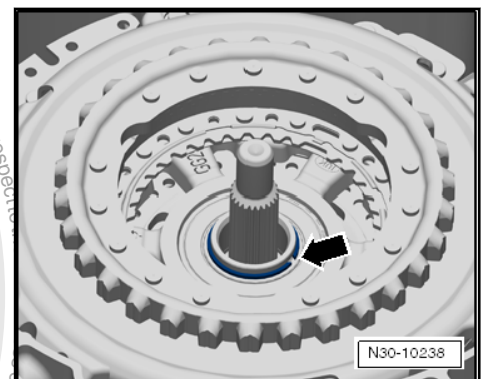


- Install the circlip -arrow-



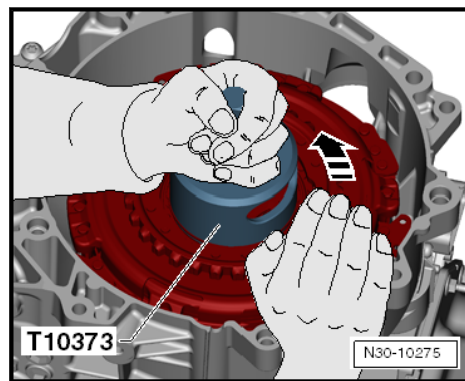
Note

The dual clutch is not pressed correctly on the stop if the locking ring cannot be installed.



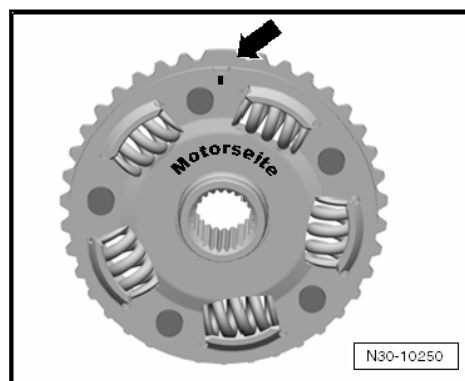
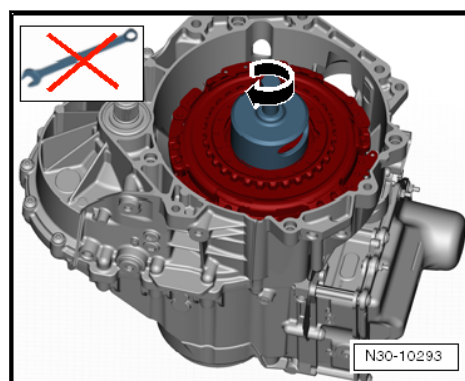


- Turn the dual clutch against the Puller - Clutch - T10373- by hand without using any other tools so that it can move into its working position in direction of -arrow-.

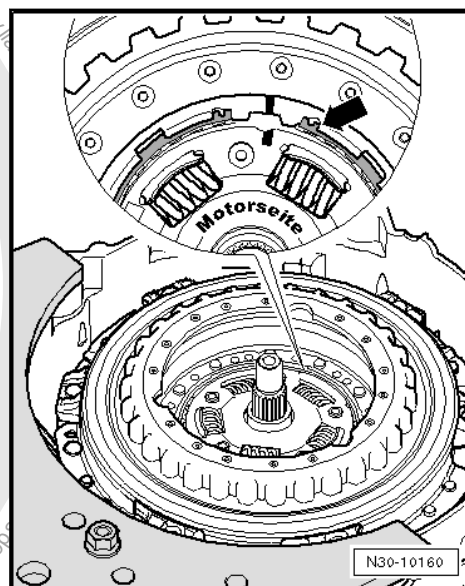


Note

- ◆ The dual clutch sits on the stop at the bottom of the input shaft. This is not its optimal position.
 - ◆ The dual clutch should be pulled up just far enough until it touches the locking ring.
 - ◆ Only turn it by hand. This way the dual clutch slides against the locking ring. Do not use any other tool.
- Install the hub.
 - The hub as a single »large tooth« -arrow- and fits in only one position.
 - The large tooth has a marking on the engine side.

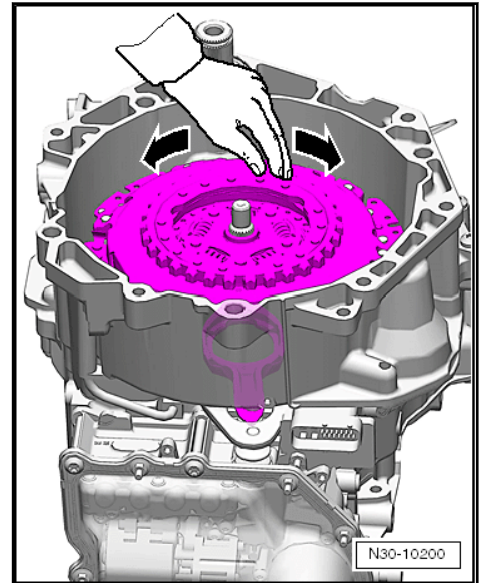


- Insert the locking ring -arrow-.
- The end of the locking ring must face the »nose« on the dual clutch.



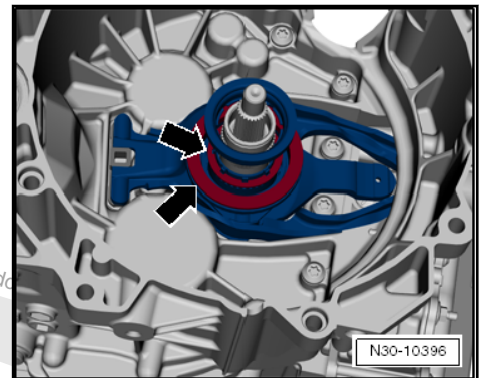


- Turn the dual clutch by hand. The dual clutch should turn without any problem.



Note

- ◆ Remove the dual clutch if it is difficult to turn or if it grinds against the clutch plates while being turned. Refer to ["2.2 DSG® Clutch, Removing", page 37](#).
- ◆ Check the installed position of the shims -arrows-.
- ◆ The shims must fit correctly and must not be damaged.
- ◆ It is possible there was a calculation error. Check the measurements one more time. Refer to ["1.3 Clutch Engaging Mechanism, Adjusting", page 22](#).
- ◆ If there was no error, then it is possible the dual clutch shifted during transportation/assembly. In this case it is necessary to install a new dual clutch. Then it is necessary to adjust the position of the engaging bearing again. Refer to ["1.3 Clutch Engaging Mechanism, Adjusting", page 22](#).

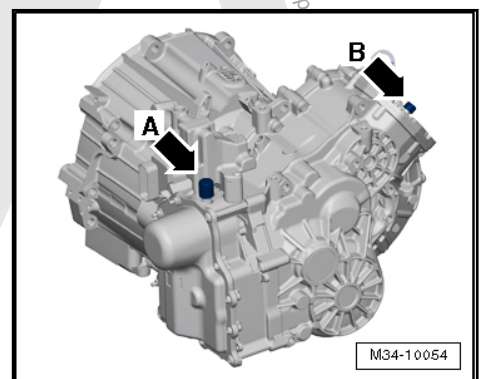


- Remove both plugs and install the vent caps -arrow A and B-.

Note

The vent cap -arrow A- on the Mechatronic will get damaged when being removed and must be replaced.

- Dispose of any extra shims.
- Perform a [Complete Basic Setting](#) using the Vehicle Diagnostic Tester [Guided Functions](#) after installing the transmission.



2.4 Input Shaft Seal, Replacing

Special tools and workshop equipment required

- ◆ Press Piece - 60mm - VW415A-
- ◆ Puller - Crankshaft/Power Steering Seal - T20143/2-
- ◆ Sealing Grease - G 052 128 A1-



Replace the seal for the outer input shaft.

Procedure

- The dual clutch is removed. Refer to ⇒ [“2.2 DSG® Clutch, Removing”, page 37](#).
- The clutch engaging mechanism is removed. Refer to ⇒ [“1.2 Clutch Engaging Mechanism, Removing and Installing”, page 19](#).



Caution

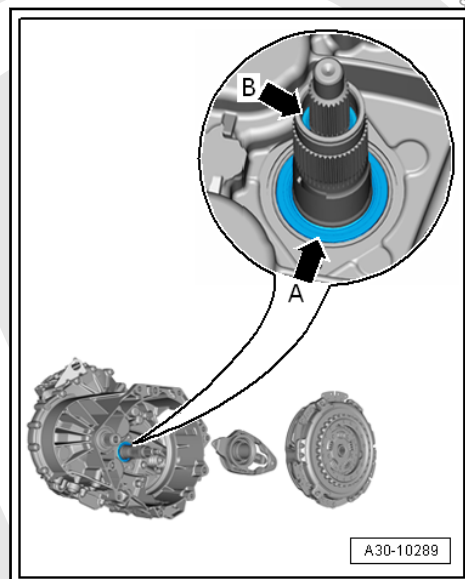
Danger of damaging the dual clutch and other components.

- **Replace the dual clutch if it is covered with oil.**

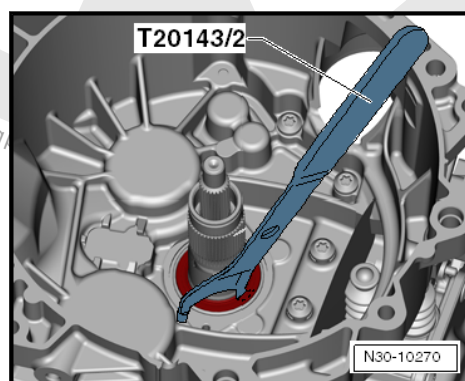


Note

- ◆ There are 2 seals in the transmission on the clutch side.
- ◆ Input shaft seal -arrow A-.
- ◆ Inner input shaft seal -arrow B-. Refer to ⇒ [“2.5 Inner Input Shaft Seal, Replacing”, page 47](#).
- ◆ It is possible to replace both seals without disassembling the transmission. It is not necessary to adjust the clutch engaging mechanism if only the seals are being replaced.



- Pry out the outer seal.



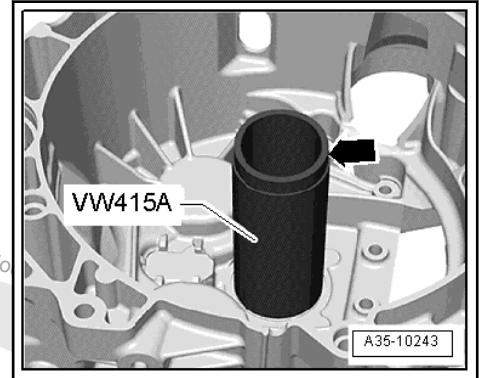


- Install the new seal for the outer input shaft with a plastic hammer so that it is flush with the clutch housing, as illustrated.



Caution

Install the seal flush with the clutch housing so that the oil bore behind it is not sealed. Otherwise the outer input shaft ball bearing will not have enough oil.



- The Press Piece - 60mm - VW415A- offset points upward -arrow-.
- Install the clutch engaging mechanism. Refer to ➤ [“1.2 Clutch Engaging Mechanism, Removing and Installing”, page 19](#).
- Install the dual clutch. Refer to ➤ [“2.3 Dual Clutch, Installing”, page 41](#).

2.5 Inner Input Shaft Seal, Replacing

Special tools and workshop equipment required

- ◆ Puller - Shaft Seal - T10420-
- ◆ Seal Installer - Shaft Seal - T10421-

Procedure

- The dual clutch is removed. Refer to ➤ [“2.2 DSG® Clutch, Removing”, page 37](#).
- The clutch engaging mechanism is removed. Refer to ➤ [“1.2 Clutch Engaging Mechanism, Removing and Installing”, page 19](#).



Caution

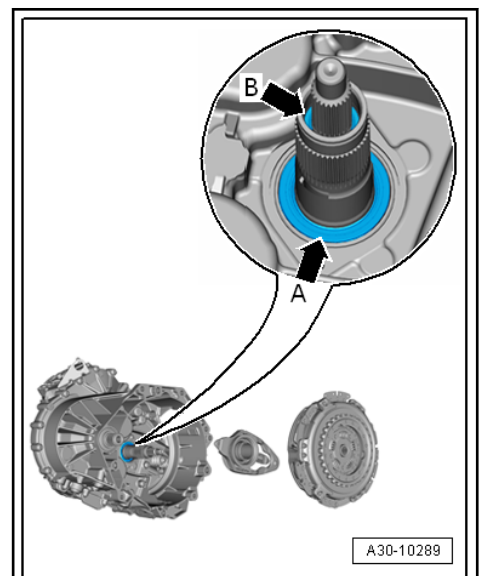
Danger of damaging the dual clutch and other components.

- *Replace the dual clutch if it is covered with oil.*



Note

- ◆ There are 2 seals in the transmission on the clutch side.
- ◆ Input shaft seal -arrow A-. Refer to ➤ [“2.4 Input Shaft Seal, Replacing”, page 45](#).
- ◆ Inner input shaft seal -arrow B-.
- ◆ It is possible to replace both seals without disassembling the transmission. It is not necessary to adjust the clutch engaging mechanism if only the seals are being replaced.

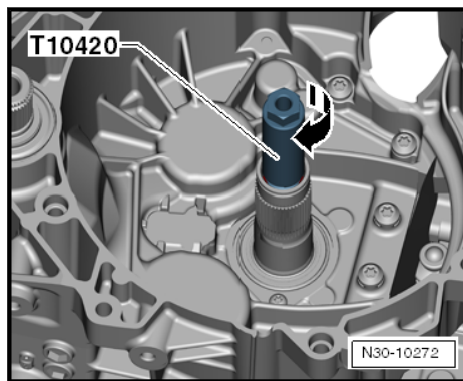




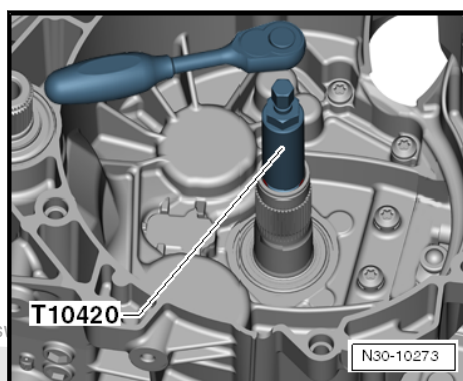
- Remove the Puller - Shaft Seal - T10420- spindle.
- Install the Puller - Shaft Seal - T10420- into the inner input shaft seal while pressing on the Puller - Shaft Seal - T10420- .

The Puller - Shaft Seal - T10420- will jam the seal when it is being turned

- Turn the Puller - Shaft Seal - T10420- just enough until the seal begins to turn with it.



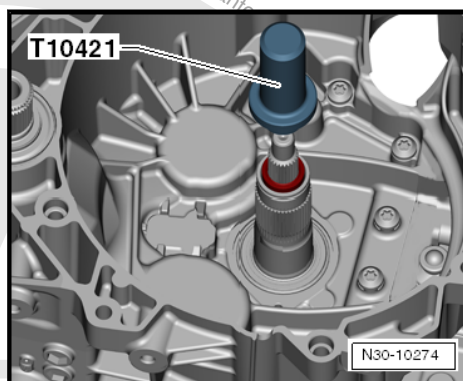
- Then install the spindle into the Puller - Shaft Seal - T10420- .
- Remove the seal using the spindle.



- Install the new seal up to the edge of the tool using Seal Installer - Shaft Seal - T10421- .

Seal Installation Depth: 17.5 ± 0.2 mm

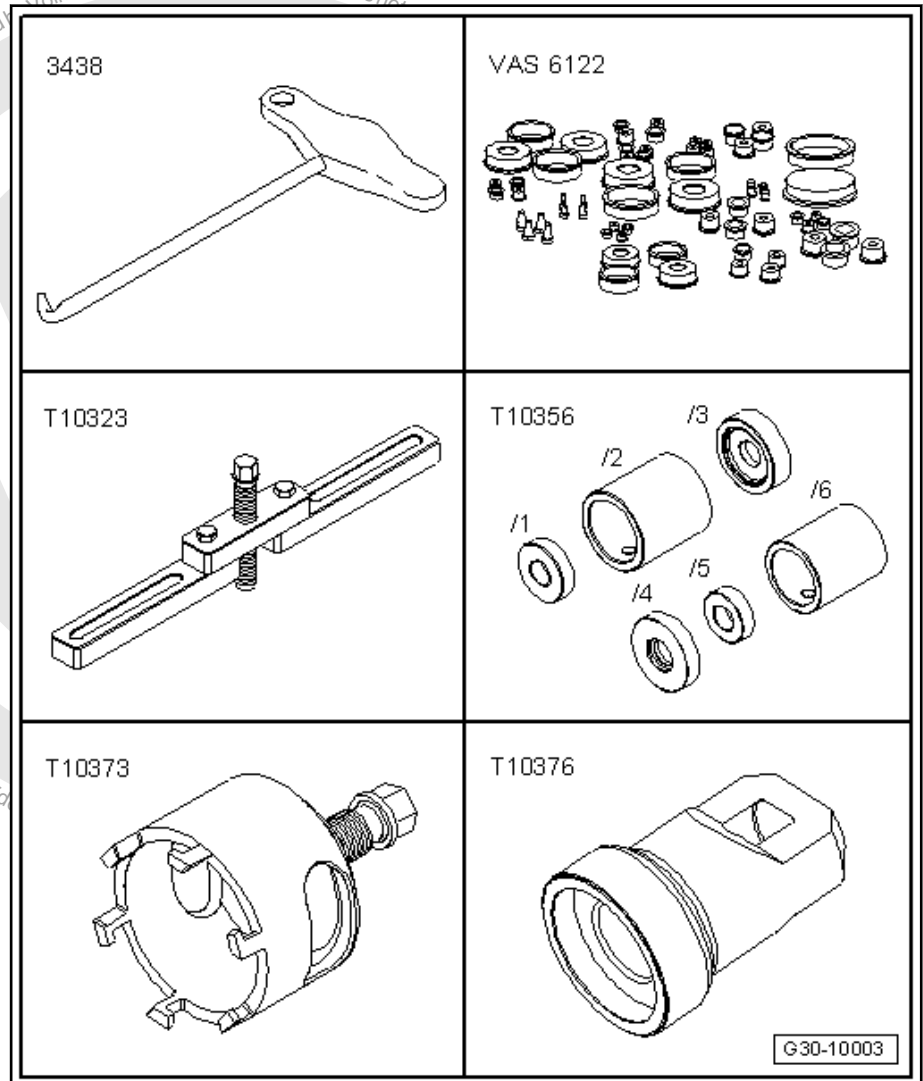
- Install the clutch engaging mechanism. Refer to ⇒ [“1.2 Clutch Engaging Mechanism, Removing and Installing”, page 19](#) .
- Install the dual clutch. Refer to ⇒ [“2.3 Dual Clutch, Installing”, page 41](#) .





3 Special Tools

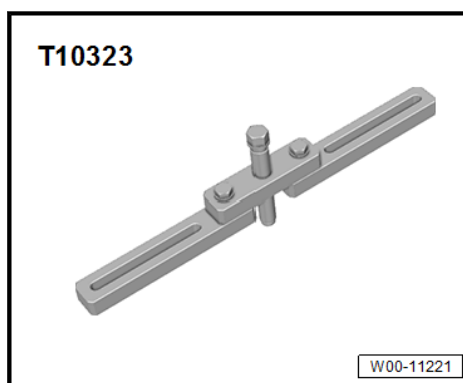
Special tools and workshop equipment required



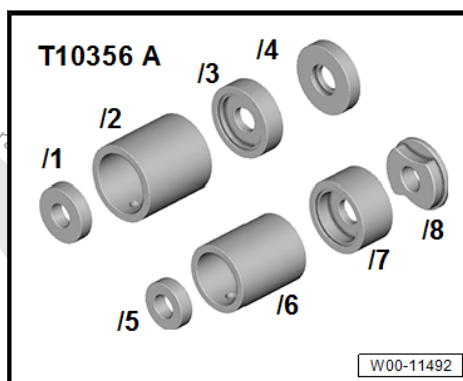
- ◆ T-Handle Hook - 3438-
- ◆ Engine Bung Set - VAS6122-
- ◆ Support Bridge - T10323-
- ◆ Subframe Bushing Assembly Tool Kit -Assembly Tool 5 - T10356/5- from the Subframe Bushing Assembly Tool Kit - T10356-
- ◆ Puller - Clutch - T10373-
- ◆ Clutch Press Piece - T10376-
- ◆ Protective Cap - 0AM 325 120 A- quantity 1 and Protective Cap - 02M 409 120- quantity 1, as an alternative to the Engine Bung Set - VAS6122-



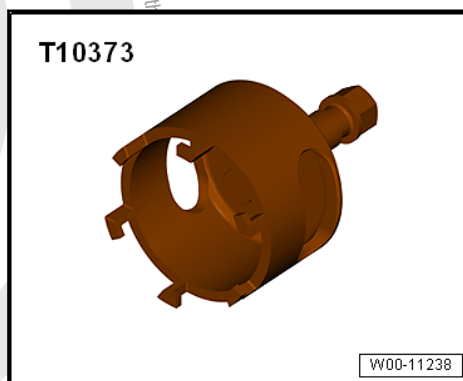
Support Bridge - T10323-



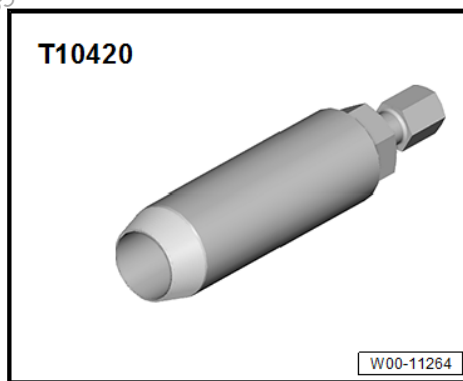
Subframe Bushing Assembly Tool Kit - Assembly Tool 5 -
T10356/5- from the Subframe Bushing Assembly Tool Kit -
T10356-



Puller - Clutch - T10373-



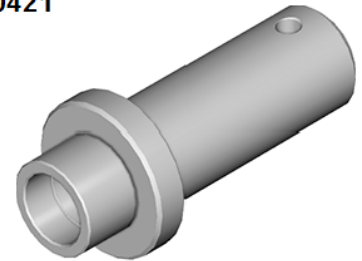
Puller - Shaft Seal - T10420-





Seal Installer - Shaft Seal - T10421-

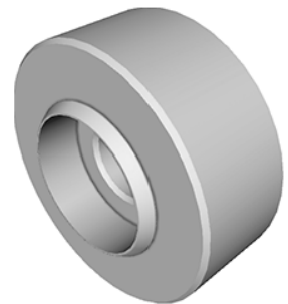
T10421



W00-11265

◆ Gauge - Clutch Bearings - T10466-

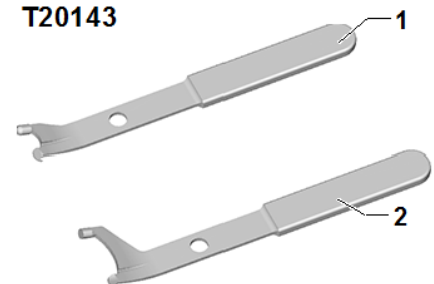
T10466



W00-11274

◆ Puller - Crankshaft/Power Steering Seal - T20143/2-

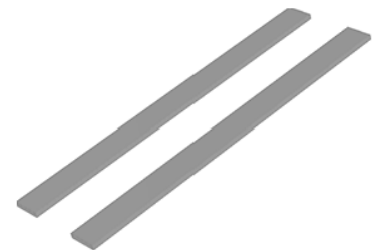
T20143



W00-11318

◆ Ruler (2 pc.) - T40100-

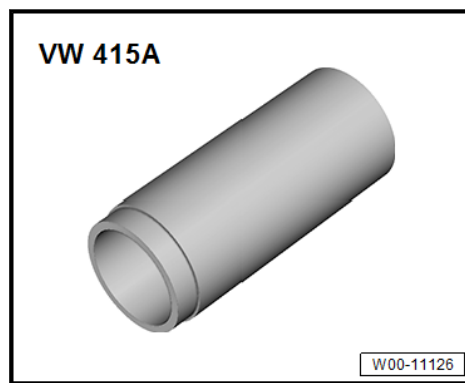
T40100



W00-11214



- ◆ Press Piece - 60mm - VW415A-



- ◆ Digital Depth Gauge - 300mm - VAS6594-





34 – Controls, Housing

1 Mechatronic

⇒ [“1.1 Overview - Mechatronic”, page 53](#)

⇒ [“1.2 Mechatronic, Removing and Installing”, page 56](#)

⇒ [“1.3 Mechatronic, Moving into Removal Position by Hand”, page 75](#)

⇒ [“1.4 Boot with Clutch Positioner, Replacing”, page 77](#)

1.1 Overview - Mechatronic



1 - Bolt

- ☐ Replace after removing
- ☐ For attaching the DSG Transmission Mechatronic - J743- to the transmission housing
- ☐ Tightening specification and sequence. Refer to ⇒ [Fig. "DSG Transmission Mechatronic - J743- - Tightening Specification and Sequence"](#), page 56
- ☐ Quantity: 3, M8 x 35

2 - Bolt

- ☐ Replace after removing
- ☐ For attaching the DSG Transmission Mechatronic - J743- to the transmission housing
- ☐ Tightening specification and sequence. Refer to ⇒ [Fig. "DSG Transmission Mechatronic - J743- - Tightening Specification and Sequence"](#), page 56
- ☐ Quantity: 4, M8 x 90

3 - O-Ring

- ☐ Replace if damaged
- ☐ Identification: Color: green ⇒ [Fig. "O-Ring Installed Position and Color Identification"](#), page 55
- ☐ Only available with hydraulic line. Refer to the Parts Catalog.
- ☐ Install on the hydraulic line connection ⇒ [Fig. "O-Ring Installed Position and Color Identification"](#), page 55
- ☐ Install with hydraulic fluid

4 - Clamp

- ☐ Remove in order to remove and install the hydraulic line clamp

5 - Hydraulic Line

- ☐ Close the connections with new plugs from the Repair Kit - 5C0 998 152- . Refer to the Parts Catalog.
- ☐ Comes with O-ring.

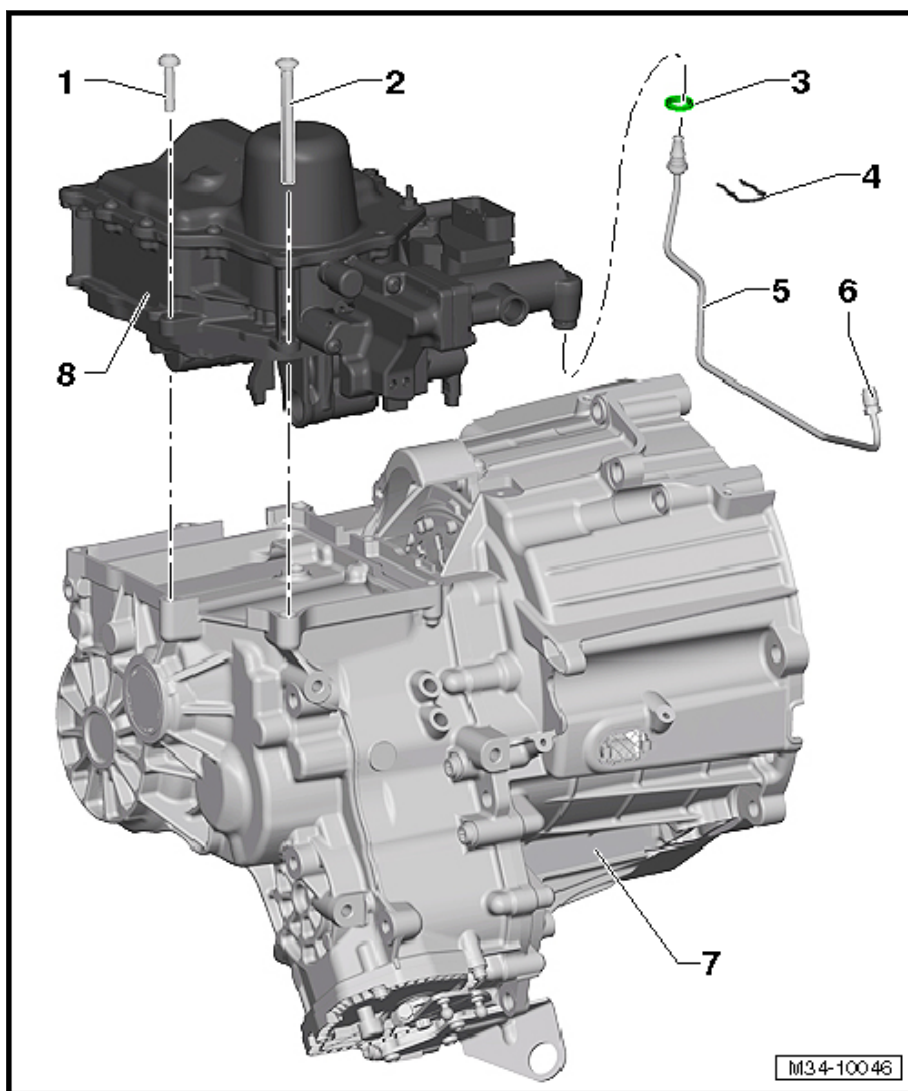
6 - Bolt

- ☐ 18 Nm
- ☐ For the hydraulic line to the engine

7 - Transmission

8 - DSG Transmission Mechatronic - J743-

- ☐ With valve block
- ☐ Do not remove the valve block from the Mechatronic . Refer to ⇒ [Fig. "Valve Block on Mechatronic"](#), page 55 .
- ☐ Refer to ⇒ ["2.4 Mechatronic Safety Precautions"](#), page 4

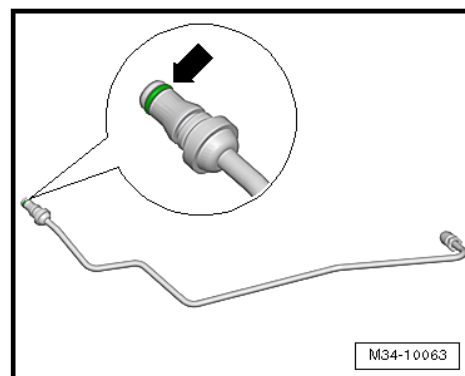




- ❑ Refer to ⇒ [“1.2 Mechatronic, Removing and Installing”, page 56](#)
- ❑ Refer to ⇒ [“1.3 Mechatronic, Moving into Removal Position by Hand”, page 75](#)

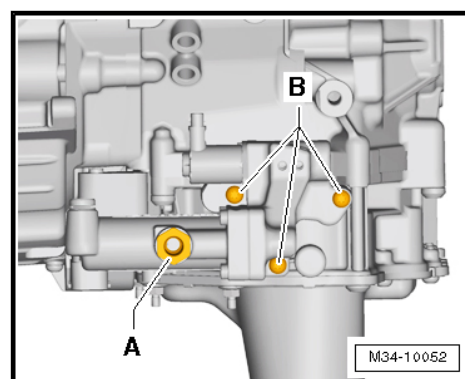
O-Ring Installed Position and Color Identification

- The O-ring -arrow- must be green. It can be used with hydraulic fluid. Do not use any other O-ring.



Valve Block on Mechatronic

- If bolt and washer -A- is missing from new Mechatronic, transfer bolt and washer from old Mechatronic to new Mechatronic. Torque bolt -A- to 15 Nm.
- Do not open the plugs -B- securing the valve block to the Mechatronic.



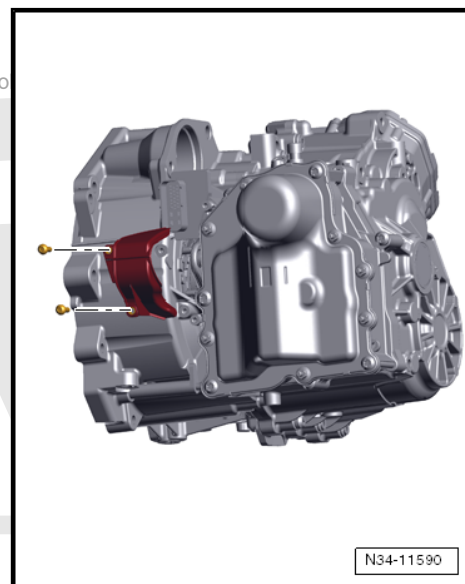
Cover of the Engaging Levers on the Clutch Mechanism - Tightening Specification



Note

The cover is installed depending on the date of manufacture.

- Tighten the bolts to 8 Nm.





DSG Transmission Mechatronic - J743- - Tightening Specification and Sequence

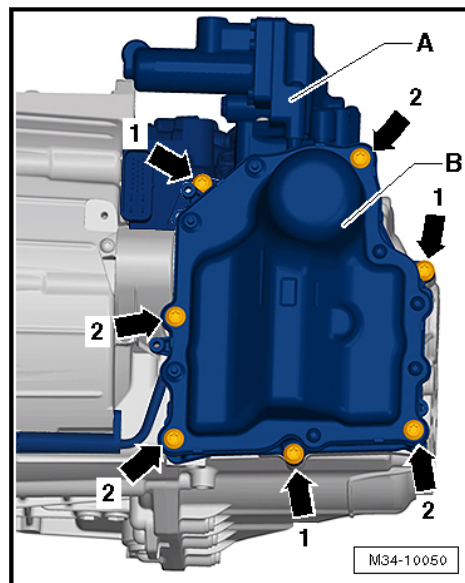


Note

Replace the bolts -arrows 1 and 2- -arrows 2-.

- Tighten the bolts in four steps as follows:

Step	Bolts	Tightening Specification
1.	-arrows 1-	Install the bolt hand-tight.
2.	Remove the Guide Bolt - Mechatronic - T10406-	
3.	-2 arrows-	Install the bolt hand-tight.
4.	-arrows 1 and 2-	10 Nm diagonally



1.2 Mechatronic, Removing and Installing

Special tools and workshop equipment required

- ◆ Vehicle Diagnostic Tester
- ◆ Used Oil Collection and Extraction Unit - SMN372500-
- ◆ Guide Bolt - Mechatronic - T10406-
- ◆ Assembly Lever - Mechatronic - T10407-
- ◆ Suction Pump - VAS5226-
- ◆ For the allocation of the plugs from the Repair Kit - 5C0 998 152- refer to the Parts Catalog.
- ◆ For the allocation of the Protective Cap - 0AM 325 120 A- refer to the Parts Catalog.

Removing

- The transmission is installed.



Caution

Danger of causing damage to the transmission.

- ◆ ***Do not let the engine run when the DSG Transmission Mechatronic - J743- is removed or when there is no transmission fluid in the engine. Do not tow the vehicle either.***



Note

- ◆ Pay attention to ⇒ *"2.4 Mechatronic Safety Precautions", page 4*.
- ◆ Pay attention to ⇒ *"3 Repair Information", page 6*.
- ◆ The dual clutch is self-adjusting. Vibrations can affect the adjusting tool. In addition, when the Mechatronic is removed, the "abrupt pulling away" of the Assembly Lever - Mechatronic - T10407- among the engaging levers will have a negative effect on the adjusting tool.
- ◆ After unpacking or installing, do not dispose of the packaging and the ventilation pipe cap of a new Mechatronic. They are required for returning the removed Mechatronic.
- ◆ The fluid in a new Mechatronic is already filled correctly. Do not drain out any fluid.



WARNING

Beware of the danger of electrocution.

An electrical shock can result in death.

Follow the High Voltage System General Warnings. Refer to ⇒ *Electrical System Hybrid; Rep. Gr. 93*; *High Voltage System General Warnings*.

- ◆ **A high voltage technician must de-energize the high voltage system before work can be performed on the high voltage system or before any servicing work can be performed on the body.**
- ◆ **Only hybrid electrically instructed persons may perform all work on a vehicle with a high voltage system. All work must be performed by a high voltage technician.**



WARNING

High voltage at the high voltage system of the hybrid vehicle. Danger of electrocution! The following procedure requires work on the high voltage system. To de-energize the high voltage system. Refer to ⇒ *Hybrid Electrical System; Rep. Gr. 93*; *High Voltage System, De-energizing*.



Note

- ◆ **Secure the rear lid so that it cannot close because the battery is going to be disconnected.**
- ◆ **Access to the luggage compartment when the power is off possible but with difficulty.**
- To de-energizing the high voltage system. Refer to ⇒ *Hybrid Electrical System; Rep. Gr. 93*; *Electric Drive; Turning off Voltage*.
- Move the selector lever into »P«.
- Connect the Vehicle Diagnostic Tester and turn on the ignition.



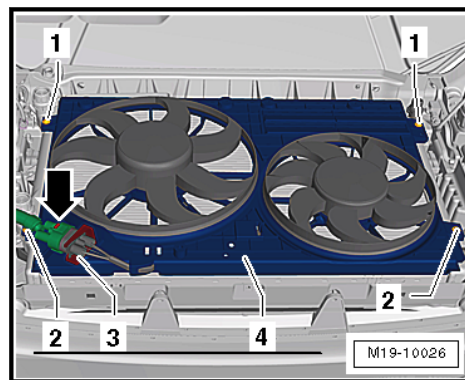
- Select **Guided Functions**.
- Select **Move Gear Selector Into -Neutral-** under "7-speed DSG® transmission".
- Turn off the ignition.
- Lift the vehicle.
- Remove the noise insulation below engine/transmission. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
- Remove the fan shroud. Refer to ⇒ Rep. Gr. 19 ; Radiator/Coolant Fan; Fan Shroud, Removing and Installing .



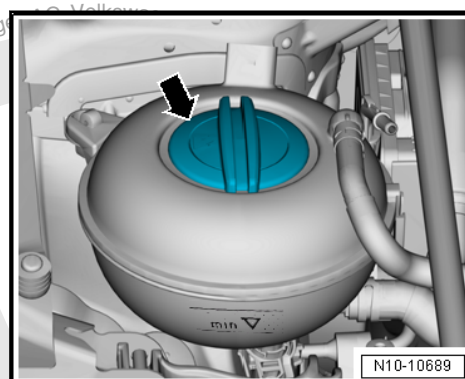
WARNING

Risk of burning due to hot steam and hot coolant.

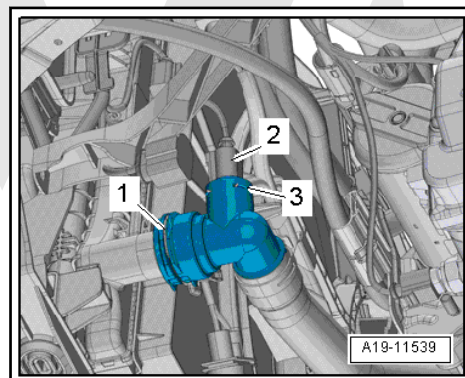
- ◆ *When engine is warm, the cooling system is under pressure.*
- ◆ *Reduce pressure by cover coolant expansion tank cap with cloths and carefully opening.*



- Remove the cap -arrow- from the coolant reservoir.
- Place the Shop Crane - Drip Tray - VAS6208- underneath.



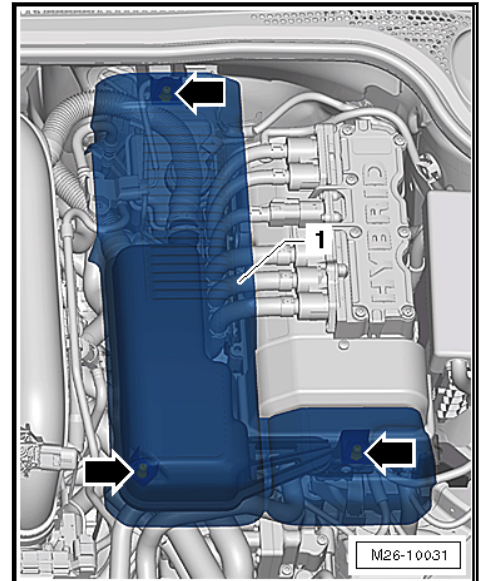
- Disconnect the connector -2- on the Engine Coolant Temperature Sensor on Radiator Outlet -G83- .
- Open the clamp -1-. Remove the left coolant hose at the bottom of the radiator and drain the coolant.
- Bring the lock carrier into the service position. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Lock Carrier; Service Position, Performing and Resetting .



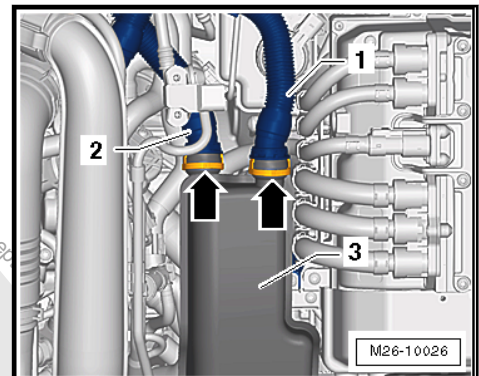


- Unclip and remove the damper cover -1- upward from the retainers -arrows-.

Vehicles with Secondary Air Injection (AIR) System



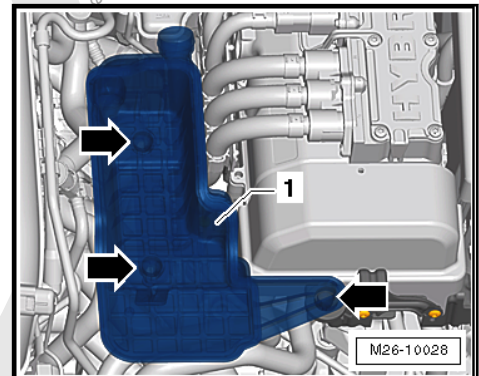
- Squeeze the locking ring -arrows- on both sides and remove the air lines -1 and 2- from the damper -3-.



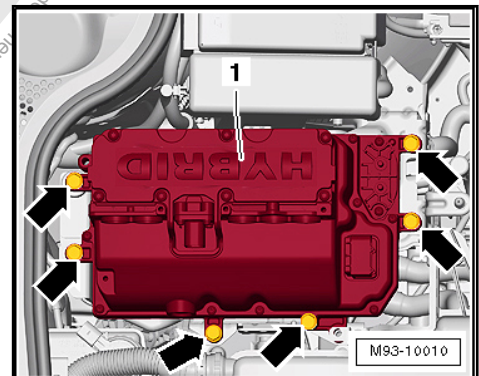
- Remove the damper -1- upward from the rubber bushings -arrows-.

For All Vehicles

- Disconnect the 12V battery. Refer to ➤ Electrical Equipment; Rep. Gr. 27 ; Battery, Disconnecting and Connecting .

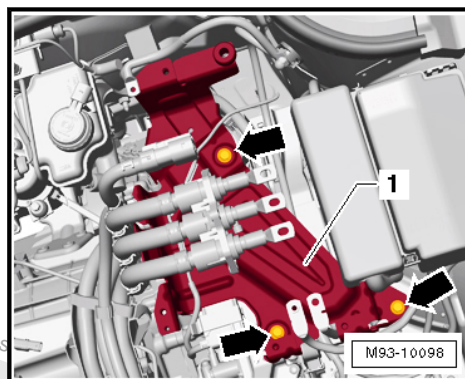


- Remove the Electric Drive Power and Control Electronics - JX1- . Refer to ➤ Electrical Equipment; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .
- Remove the high voltage cables bracket from the transmission housing. Shown in illustration below, not called out.





- Remove the bracket -1- for the Electric Drive Power And Control Electronics - JX1- -arrows-. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage Cables; High Voltage Battery High Voltage Cable Set, Removing and Installing .



- Disconnect the connector -1- from the valve -2- on the Mechatronic and pull the wiring harness from the front bracket on the transmission.

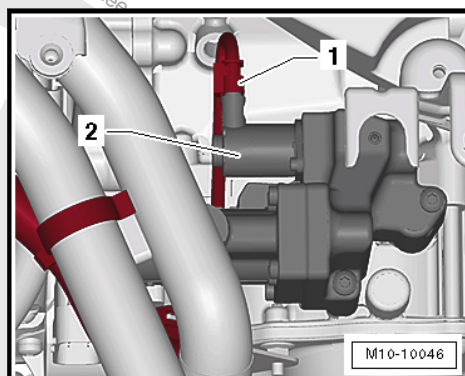


WARNING

Danger of dirt.

Always clean the connection locations and the area around them before loosening.

The Mechatronic hydraulic system is not open. Dirt can cause the system to malfunction.

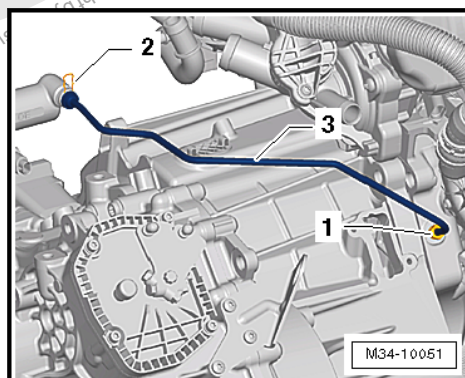


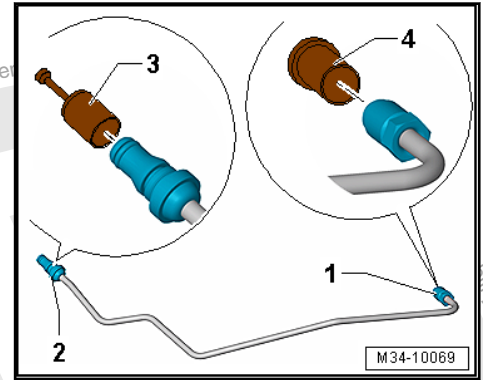
If Hydraulic Line Doesn't Need to Be Removed

- Remove the clamps -2- from the valve block/Mechatronic.
- Seal the hydraulic line connection -2- with new sealing plug -3-.

If Hydraulic Line Needs to be removed

- Remove the bolt -1- for the hydraulic line -3- on the engine.
- Remove the clamps -2- from the valve block/Mechatronic.
- Remove the hydraulic line -3- on the engine and valve block/ Mechatronic at the same time.



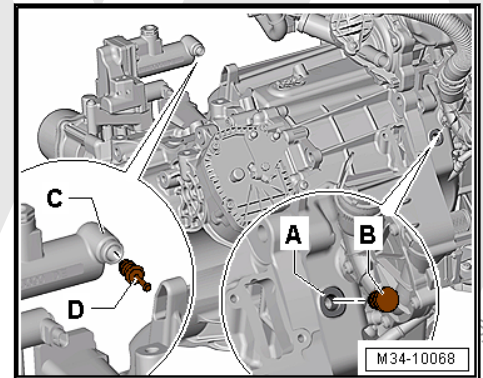


- Seal the hydraulic line connections -1 and 2- immediately with new sealing plugs -3 and 4- from the Repair Kit - 5C0 998 152- . Preferably the hydraulic fluid should remain in the line if possible, otherwise it should not become dirty.
- Seal the connections on the engine -A- and the valve block/ Mechatronic -C- with new sealing plugs -B and D- from the Repair Kit - 5C0 998 152- .
- Always use new plugs from the Repair Kit - 5C0 998 152- . Refer to the Parts Catalog. The sealing plugs cannot be used again.

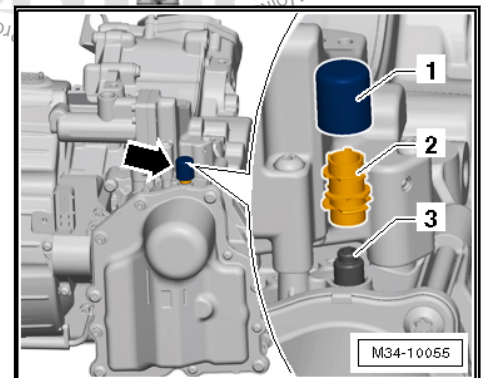


Note

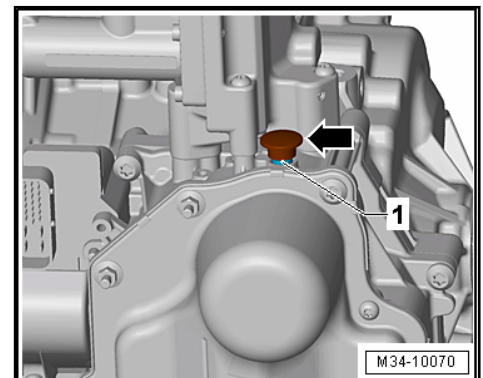
The engine/transmission is not shown in the illustration.



- Remove the cap -1- from the Mechatronic. The bleeder -2- remains on the ventilation -3- while doing this.



- The bleeder -2- must be removed so that no hydraulic fluid can leak out of the Mechatronic.
- The bleeder will get damaged and must be replaced during installation.
- Seal the breather -1- with a plug or the Protective Cap - 0AM 325 120 A- so that no fluid can leak out -arrow-. Refer to the Parts Catalog.





- If equipped remove the cover over the engaging levers.
The cover prevents dirt from getting in.

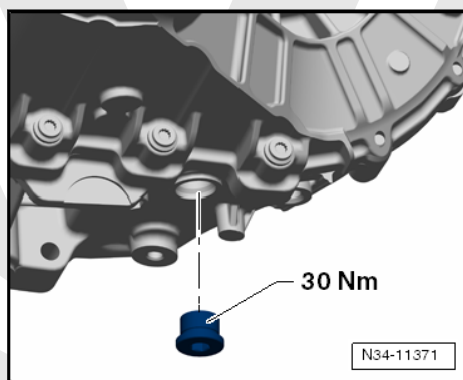
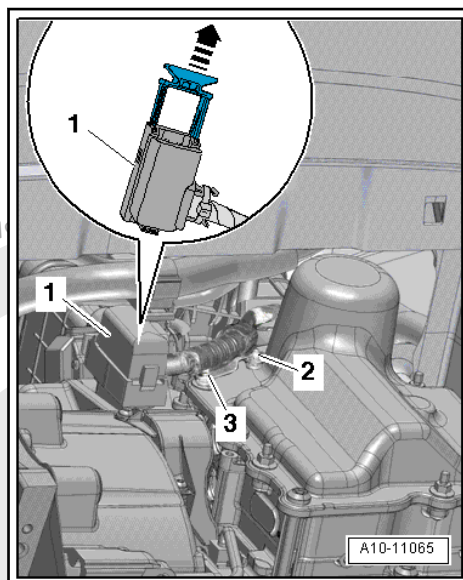
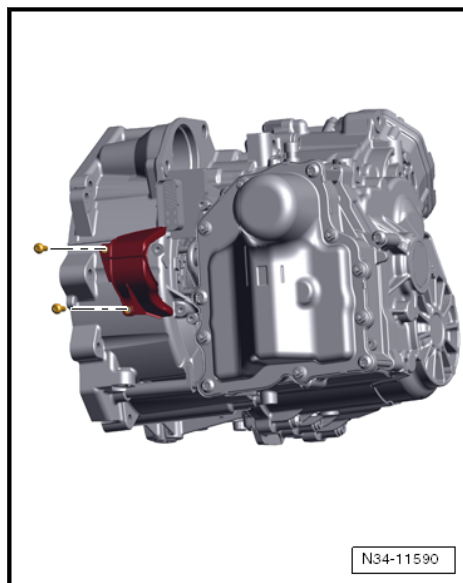


Caution

Risk of damaging transmission components.

- ◆ ***Never touch the contacts in the transmission connector.
The electrostatic discharge will damage the control module and Mechatronic.***

- To electrostatically discharge, touch the Ground (GND) (without glove).
- Disconnect the connector -1- for the DSG Transmission Mechatronic - J743- by pulling the locking mechanism upward in direction of -arrow-.
- Remove the nuts -2 and 3- from the double bolts.
- Remove the bracket for the electric wires from the transmission.
- Place the Used Oil Collection and Extraction Unit - SMN372500- underneath.
- Remove the drain plug from the transmission.
- Drain the fluid and then install the drain plug and tighten it.



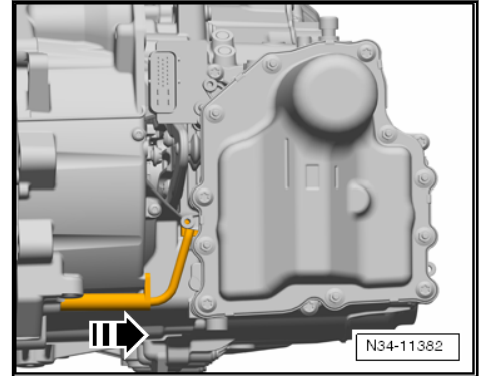


- Unclip Transmission Input Speed Sensor 3 - G641- carefully from the housing in direction of -arrow- with a screwdriver.

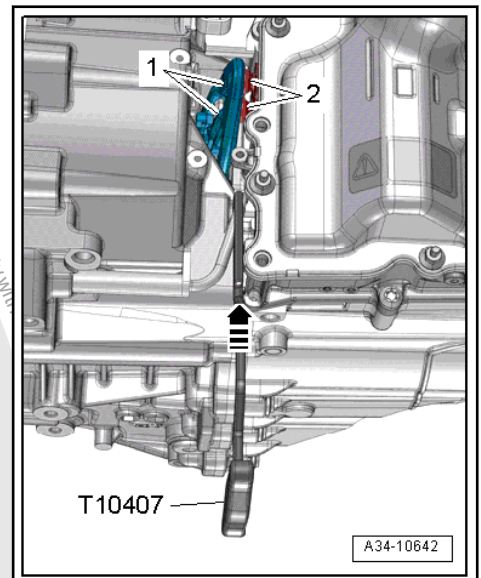


Note

In the following work step, both engaging levers on the dual clutch are lifted by the Mechatronic valve lifters. Otherwise the engaging levers will jam the Mechatronic by the lifters and then it is not possible to remove the Mechatronic.



- Insert the Assembly Lever - Mechatronic - T10407- under the lifter -2- between the transmission housing and both engaging levers -1- in direction of -arrow-, as illustrated.

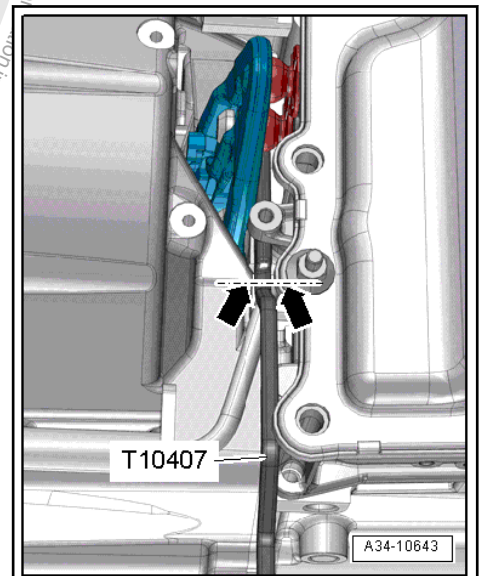


Insert the Assembly Lever - Mechatronic - T10407- just far enough until the groove on it lines up with the rib on the housing -arrows-, as illustrated. Do not insert it all the way.



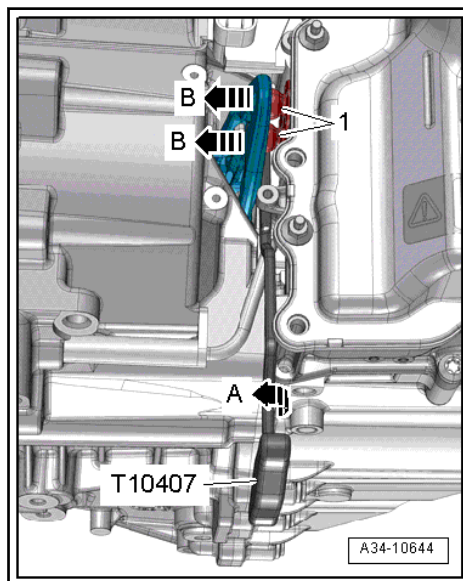
Note

The back of the Assembly Lever must touch the transmission housing.





- Turn the Assembly Lever - Mechatronic - T10407- counter-clockwise 90° -arrow A-, in order to lift the engaging lever off the lifters -1- in direction of -arrow B-.





- Hold the Assembly Lever - Mechatronic - T10407- against the transmission housing with a screwdriver to prevent it from slipping while turning it.



Note

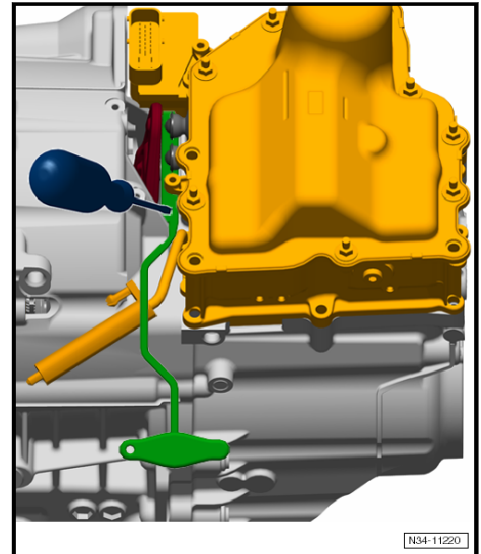
- ◆ The Assembly Lever - Mechatronic - T10407- remains inserted between the engaging levers and transmission housing while removing and installing the Mechatronic.
- ◆ Press the Assembly Lever - Mechatronic - T10407- against the transmission housing, if necessary.



Caution

Risk of damaging transmission components.

- ◆ Touch or remove the DSG Transmission Mechatronic - J743- only after having electrostatically discharged yourself by touching a grounded metal object (for example, bare handed with a ground).
- ◆ Never touch the contacts in the transmission connector. The control module as well as the Mechatronic can become damaged by the static discharge.



- To electrostatically discharge, touch the ground (without glove). Do not touch connector or »open« electronic components directly.



Caution

Risk of damaging the DSG Transmission Mechatronic - J743- .

- ◆ Do not loosen the bolts on the cover for the DSG Transmission Mechatronic - J743- .
- ◆ Place the removed DSG Transmission Mechatronic - J743- so that no fluid can leak out.
- ◆ Do not remove the valve block from the Mechatronic .



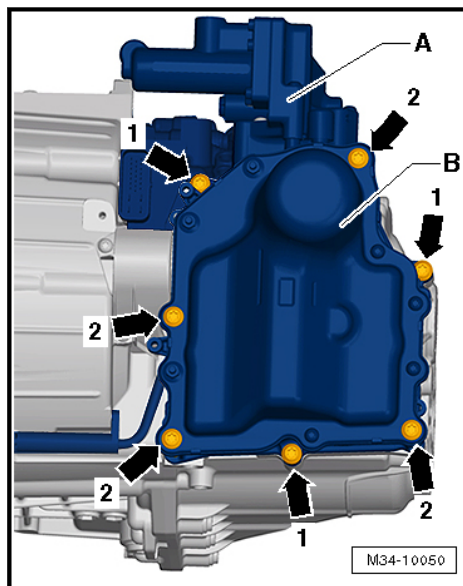
- Remove the bolts -arrows 2- diagonally.
- Remove the bolts -arrows 1-.
- Remove the Mechatronic -B- and valve block -A- from the transmission.



Caution

Risk of damaging the DSG Transmission Mechatronic - J743- .

- ◆ *It may not be possible to remove the Mechatronic.*
- ◆ *In this case, the gear selector is caught on the top of the Mechatronic on the left side.*
- ◆ *Do not use increased force to remove the Mechatronic.*
- ◆ *In this case, it will be necessary to manually move the Mechatronic into its removal position. Refer to ⇒ "1.3 Mechatronic, Moving into Removal Position by Hand", page 75 .*

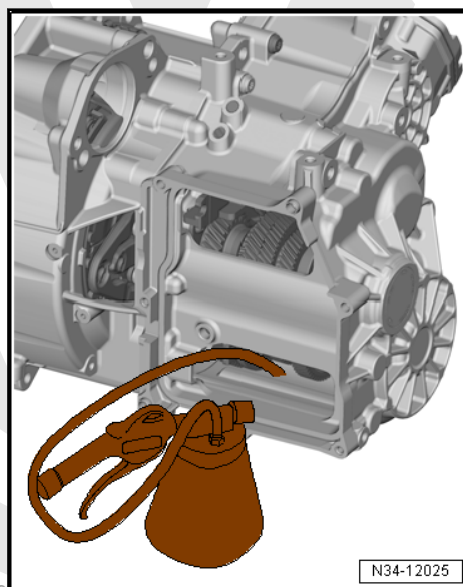


Note

Before installing the Mechatronic the rest of the oil must be extracted from the transmission.

- Extract the remaining oil from the transmission using the Suction Pump - VAS5226- .

Installing





- Seal the Mechatronic vent with a plug or the Protective Cap - 0AM 325 120 A- so that no fluid can leak out. Refer to the Parts Catalog.
- The connection on the valve block/Mechatronic is sealed with a sealing plug -arrow- from the Repair Kit - 5C0 998 152- .

i Note

- ◆ *The fluid in a new Mechatronic is already filled correctly.*
- ◆ *The new Mechatronic is already sealed with the Protective Cap - 0AM 325 120 A-.*
- ◆ *Make sure all shift forks are in the center position before installing the DSG Transmission Mechatronic - J743- .*
- ◆ *The following illustration shows the center position as -N-.*
- ◆ *In this position, there is no gear engaged and neutral is selected.*

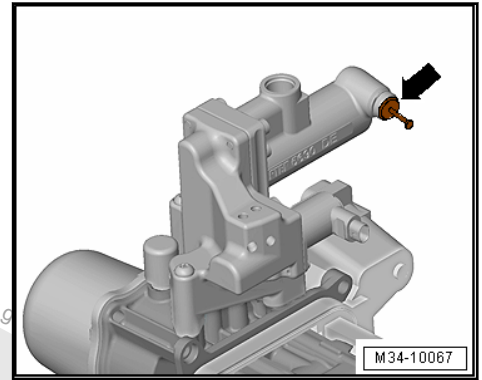
– Check each of the 4 shift forks by hand first.

Each shift fork has three positions:

- ◆ Gear engaged
- ◆ Neutral -N-
- ◆ Gear engaged
- Move all four shift forks one time into each position -arrows- one after the other.
- After doing this, move the shift forks back into the center position -N-.

i Note

Turning the switch slightly makes it easier to shift the forks.





N - Neutral

R - Reverse Gear

1 - First Gear

2 - Second Gear

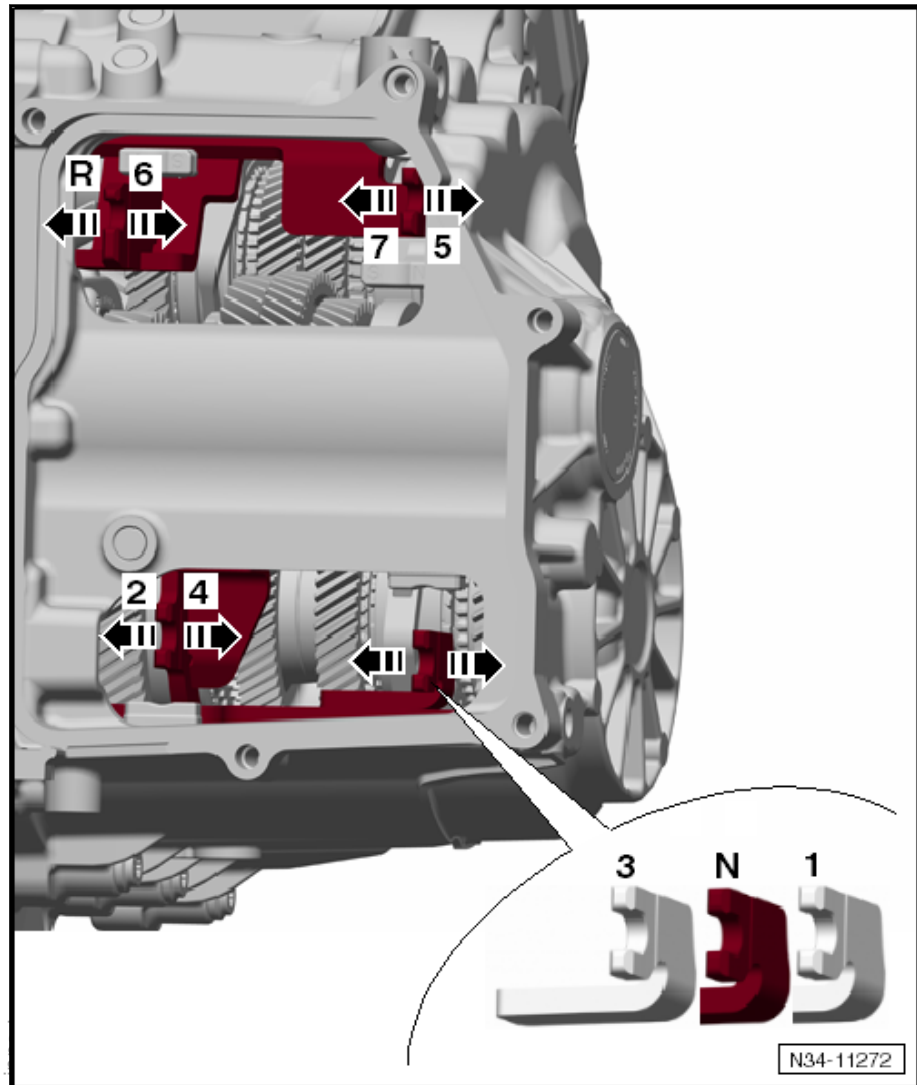
3 - Third Gear

4 - Fourth Gear

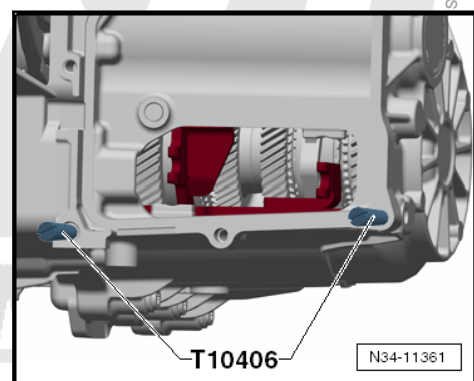
5 - Fifth Gear

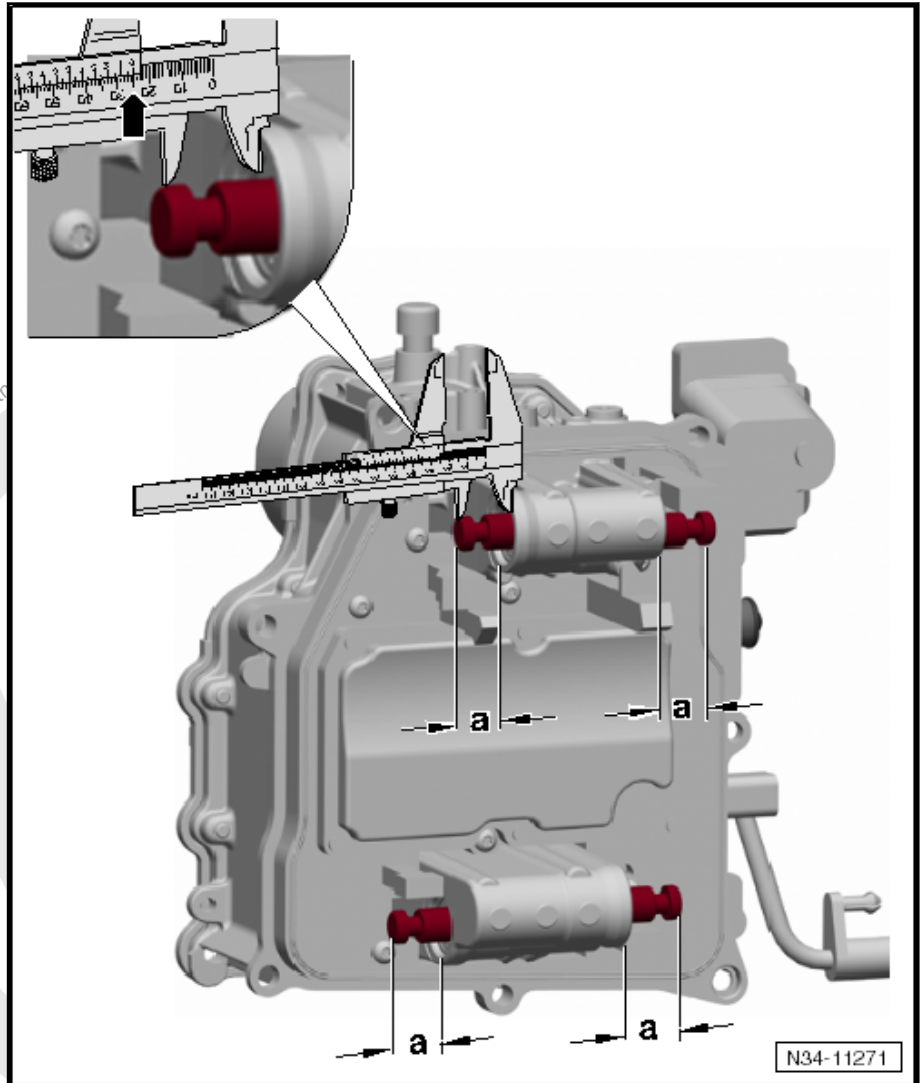
6 - Sixth Gear

7 - Seventh Gear



- Clean the sealing surface, which the Mechatronic will be touching later.
- Install the Guide Bolt - Mechatronic - T10406- hand tight.





Adjust the gear selector:



Caution

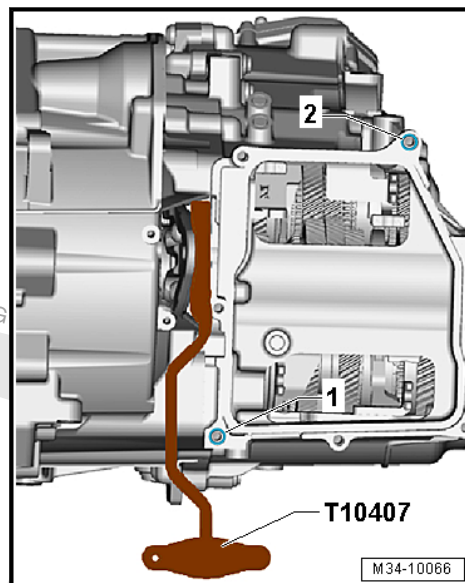
Risk of damaging the DSG Transmission Mechatronic - J743-.

Do not pry out the plunger on the sensors.

- Move the four gear selectors on the back of the DSG Transmission Mechatronic - J743- into the correct positions.
- Correct position: -a- = 25 mm
- Clean the sealing surface on the Mechatronic.



- The seal on the DSG Transmission Mechatronic - J743- must fit completely into the groove.
- The Assembly Lever - T10407- is inserted between the engaging lever and the transmission housing.
- The two alignment sleeves -1 and 2- for centering the Mechatronic on the transmission housing must be installed.



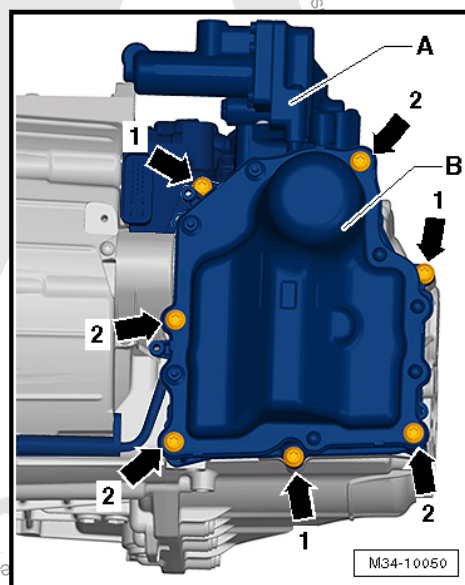
- Mount the Mechatronic -B- together with the valve block -A-. Make sure that the Mechatronic gear positions are not pressed out of their position.
- Hand-tighten bolts arrows 1 and 2- and remove the Guide Bolt - Mechatronic T10406- .
- Tighten the Mechatronic bolts. Refer to ⇒ [Fig. "" DSG Transmission Mechatronic -J743- - Tightening Specification and Sequence""](#) , page 56 .



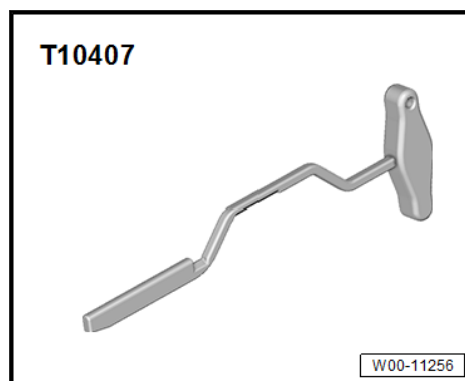
Caution

There is a risk of damaging the clutches.

- ◆ *If the engaging levers hit the Mechatronic clutch positioner, they will get overloaded and the clutch self-adjustment will be active. It is not possible to reset the self-adjustment.*

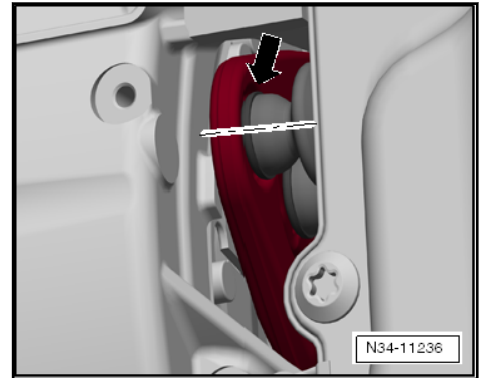


- Both clutch positioners must fit correctly into the mounts on the clutch engaging levers.
- The rubber grommets on the clutch positioners must not be damaged.
- The rubber grommets must seal the Mechatronic tight.
- Turn the Assembly Lever - Mechatronic - T10407- slowly and carefully clockwise and remove it.

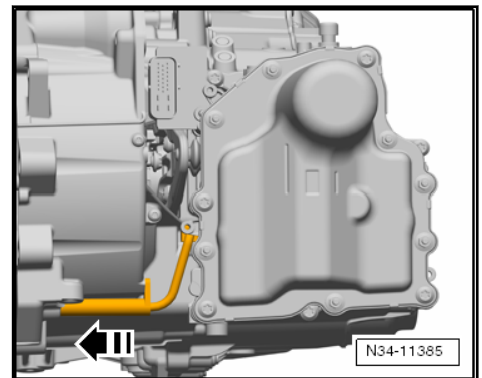




- The lifters must move slowly into the mounts.
- Pull the lifters far enough until they fit correctly in the mounts.



- Install the Transmission Input Speed Sensor 3 - G641- .
- Be careful of the sensor. The clip must not be damaged.
- The sensor must fit completely in its retainer and must be touching the transmission housing. Replace the Mechatronic if the sensor is loose or if the clip is broken.

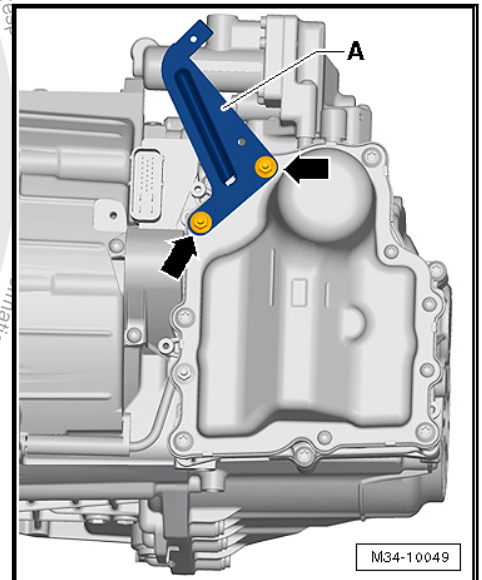


Caution

Danger of causing damage to transmission components.

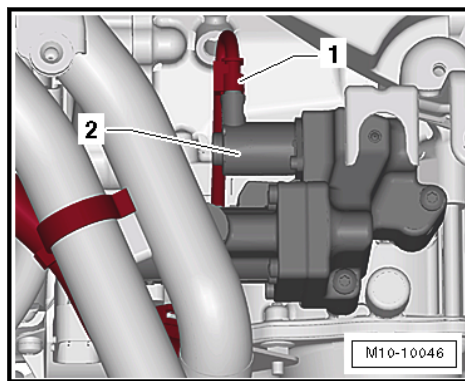
- ◆ ***Never touch the contacts in the transmission connector. The control module as well as the Mechatronic can become damaged by the static discharge.***

- To electrostatically discharge, touch the ground (without glove). Do not touch connector or »open« electronic components directly.
- Connect and lock the Mechatronic connector.
- Attach the front bracket -A- to the transmission -arrows-.



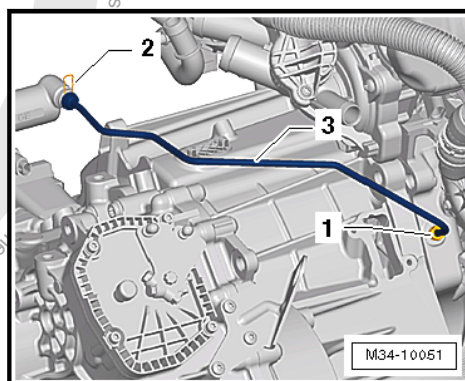
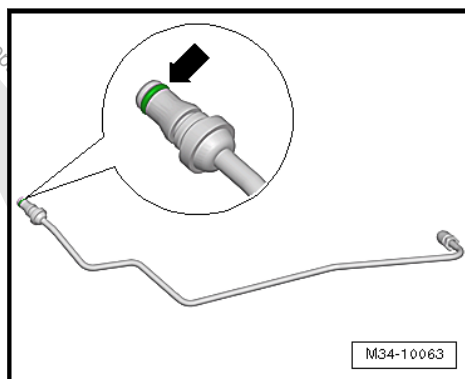


- If a protective cap is located in the switch valve connector -2-, it must be removed before attaching the connector -1-.
- Connect the connector -1- to the valve -2- on the Mechatronic and attach the wiring harness to the front bracket on the transmission.

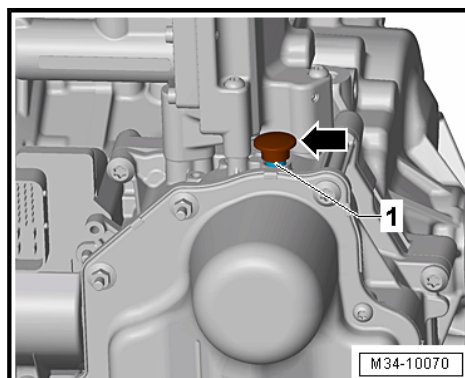


Note

- ◆ Check the O-ring -arrow- on the hydraulic line for damage and replace, if necessary. Refer to the Parts Catalog.
 - ◆ The O-ring must appear green. It can be used with hydraulic fluid. Do not use any other O-ring.
 - ◆ Remove and dispose of the sealing plugs on the hydraulic line as well as on the engine and valve block/Mechatronic just before installation. The sealing plugs cannot be used again.
- Install the hydraulic line -3- on the engine and valve block/Mechatronic.
 - Push the clamps -2- onto the valve block/Mechatronic.
 - Pull on the hydraulic pipe -3- to check it.
 - Tighten the bolt -1- on the engine for the hydraulic line to the tightening specification.



- Remove the Protective Cap -arrow- from the vent -1- on the DSG Transmission Mechatronic - J743- .





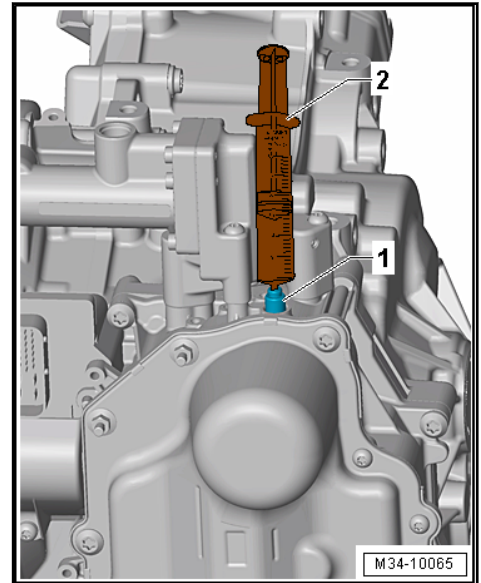
- If more than 20 ml of hydraulic fluid leaked out, then at least 30 ml (may need more depending on how much leaked out) of hydraulic fluid must be added via the vent -1- using the disposable syringe -2-.
- For the disposable syringe from the Repair Kit - 5C0 998 152- and the correct hydraulic fluid. Refer to the Parts Catalog.
- Fill the new disposable syringe with at least 30 ml hydraulic fluid from the new Power Steering Fluid - G 004 000 M2- container.



Caution

Risk of causing damage to the Mechatronic.

- ◆ **Always use a new container to comply with cleanliness requirements.**
- ◆ **Note the hydraulic fluid expiration date.**
- ◆ **Always use a new disposable syringe from the Repair Kit - 5C0 998 152- . The disposable syringe must not be reused.**



- Push the new cap -1- on the ventilation -3-. It is replacement part with a vent -2-.



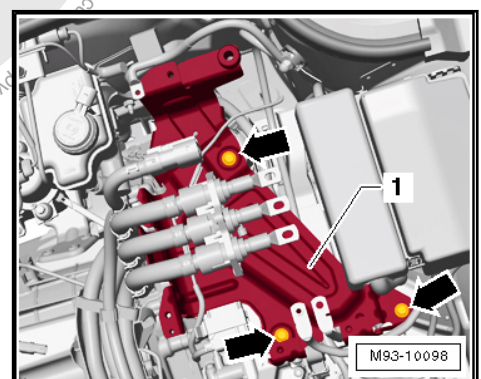
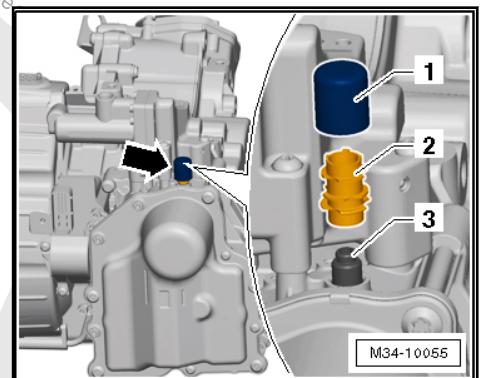
Note

If the Mechatronic is being replaced, install a sealing plug on the old Mechatronic so that the fluid cannot leak out.

Assemble the rest in reverse order. Note the following:

- Fill the transmission fluid. Refer to ➔ [“9.1 Transmission Fluid, Draining and Filling”, page 153](#) .
- Check the adjustment of the selector lever cable; re-adjust if necessary ➔ [“2.7 Selector Lever Cable, Checking and Adjusting”, page 99](#) .
- Install the bracket -1- for the Electric Drive Power And Control Electronics - JX1- -arrows-. Refer to ➔ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage Cables; High Voltage Battery High Voltage Cable Set, Removing and Installing .
- Install the high voltage cables bracket on the transmission housing. Shown in illustration below, not called out.

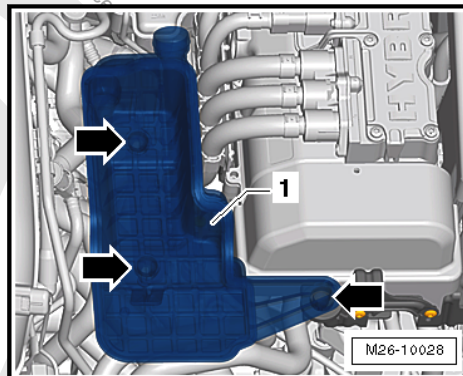
Install the Electric Drive Power and Control Electronics - JX1- . Refer to ➔ Electrical Equipment; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .



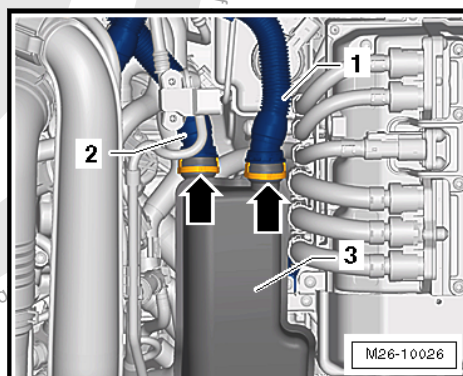


Vehicles with Secondary Air Injection (AIR) System

- Install the damper -1-.

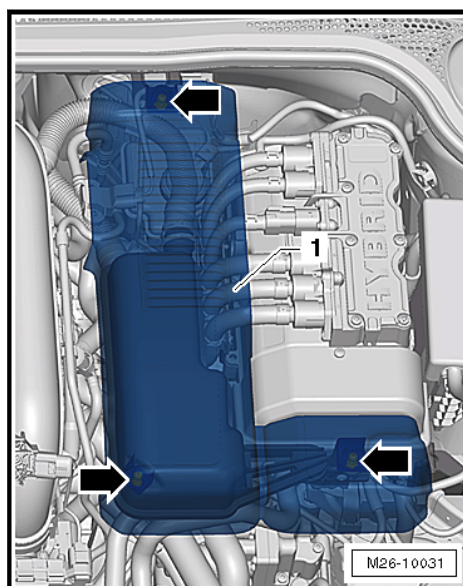


- Attach the air line -1 and 2- to the damper -3-.



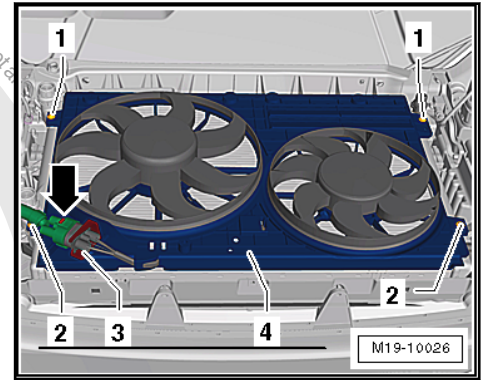
For All Vehicles

- Install the damper cover -1-.
- Connect the 12V battery. Refer to ⇒ Electrical Equipment; Rep. Gr. 27 ; Battery, Disconnecting and Connecting .
- Reset the service position. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Lock Carrier; Service Position, Performing and Re-setting .





- Install the fan shroud. Refer to ⇒ Rep. Gr. 19 ; Radiator/Coolant Fan; Fan Shroud, Removing and Installing .
- Fill the engine coolant. Refer to ⇒ Rep. Gr. 19 ; Cooling System/Coolant; Coolant, Draining and Filling .
- Install the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
- Energize the high voltage system and complete the required documentation. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System, Energizing .
- Bleed the hydraulic clutch mechanism for the decoupler using the Vehicle Diagnostic Tester in Guided Functions after energizing the high voltage system.



Note

The decoupler in Electro-Drive Drive Motor - V141- separates the internal combustion engine from the Electro-Drive Drive Motor - V141- .

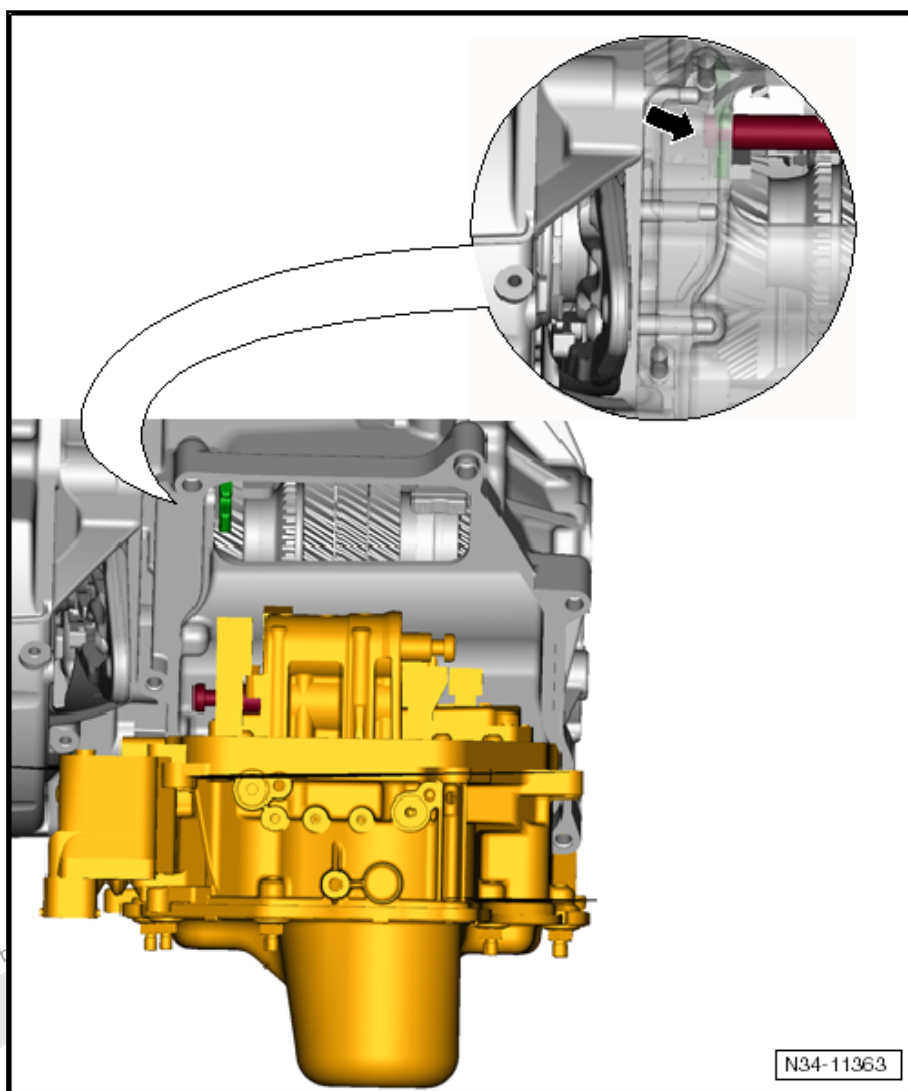
- Perform basic measurement. Refer to ⇒ [“3.4 Working with Tester”, page 10](#) .

Tightening Specifications

- ◆ Refer to ⇒ [Fig. ““DSG Transmission Mechatronic J743- - Tightening Specification and Sequence””, page 56](#)
- ◆ For the hydraulic line bolt to the engine. Refer to ⇒ [“1.1 Overview - Mechatronic”, page 53](#) .

1.3 Mechatronic, Moving into Removal Position by Hand

- Move the Mechatronic by hand into its removal position only if it is not possible to adjust the removal position using the Vehicle Diagnostic Tester .



Procedure

It may not be possible to remove the Mechatronic. In this case, the gear selector will get caught at the top on the left side on the transmission housing -arrow-.

The gear selector that is caught must now be push into a removal position by hand. It is necessary to remove the cover on the gearshift shaft.

- Install the Mechatronic completely into the transmission and secure it with a bolt.
- Move the selector lever into "P".



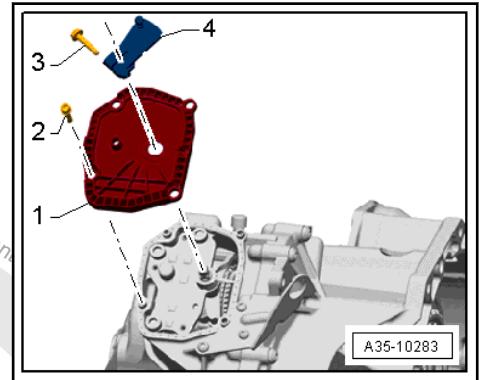
- Remove the cover from the parking lock -1-. Refer to ➤ [“3.1 Parking Lock Cover, Removing and Installing”, page 233](#).



Caution

Danger of causing damage to the Mechatronic if it falls out.

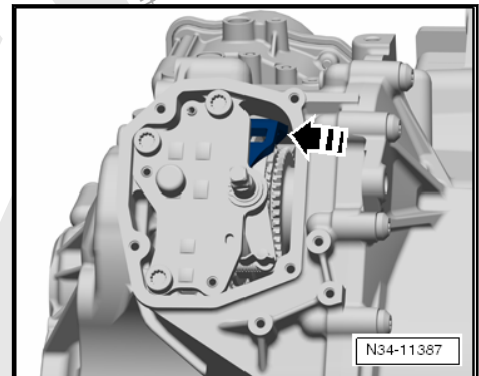
- ◆ *In the following procedure the Mechatronic is loose and could fall. Secure the Mechatronic to the transmission with 1 bolt to prevent it from falling down.*



- Push the shift fork to the side through the opening in direction of -arrow-.

The gear selector that is caught will be pushed back and it will be possible to remove the Mechatronic.

- Remove the Mechatronic.

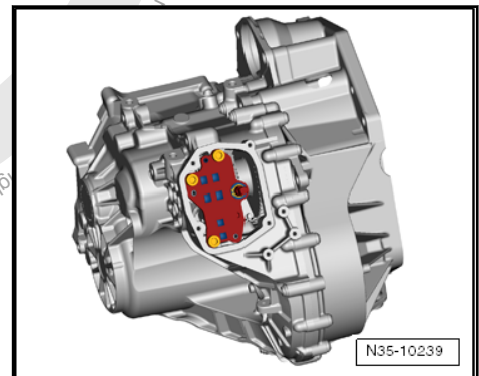


- After completing the work on the Mechatronic and it is installed, fill the transmission fluid via the parking lock. Refer to ➤ [“9.1 Transmission Fluid, Draining and Filling”, page 153](#).



Note

- ◆ *When filling the transmission with transmission fluid via the parking lock, it is not necessary to remove the transmission bleed cap on the parking lock cover. It is possible to fill the transmission fluid directly on the parking lock.*
- ◆ *Procedure, capacities and transmission fluid specification. Refer to ➤ [“9.1 Transmission Fluid, Draining and Filling”, page 153](#).*



- Install the cover for the parking lock -1-. Refer to ➤ [“3.1 Parking Lock Cover, Removing and Installing”, page 233](#).

1.4 Boot with Clutch Positioner, Replacing

Special tools and workshop equipment required

- ◆ Refer to the Parts Catalog for the correct cleaning solution.



Caution

Risk of causing damage to the Mechatronic

- ◆ ***To perform a problem-free and successful repair, extreme caution and cleanliness, as well as properly functioning tools are an important requirement.***
- ◆ ***The clutch positioner pistons are magnetic. Remove the new clutch positioner from the packaging just before installing to ensure the greatest cleanliness.***
- ◆ ***Install the clutch positioner right after removing from the packaging, do not set it down before installing.***

Requirements

- The Mechatronic is removed and the Mechatronic bleed hole is sealed tightly. Refer to ⇒ **"1.2 Mechatronic, Removing and Installing", page 56** ,

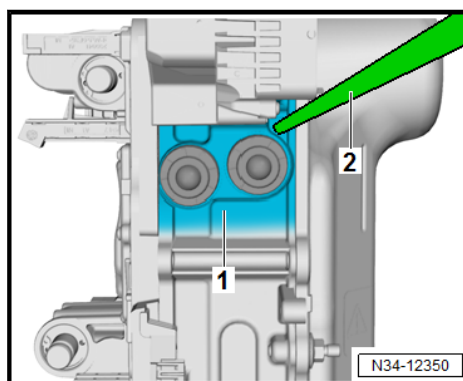
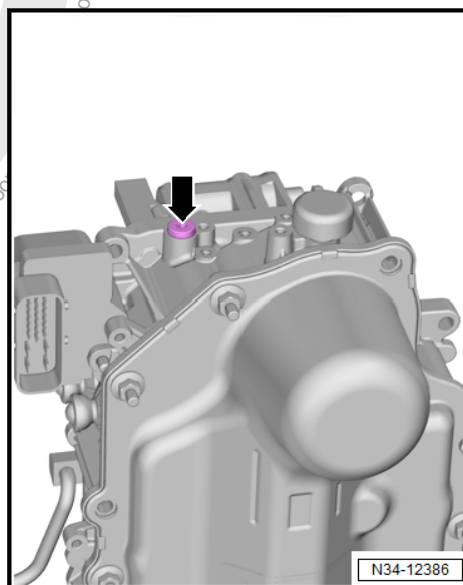
Procedure

- Place the Mechatronic on an even clean surface for example a work bench. Point the oil filler plug -arrow- upward.



Note

The area around the clutch positioner must be clean and dry. Any contamination can later lead to leaks.



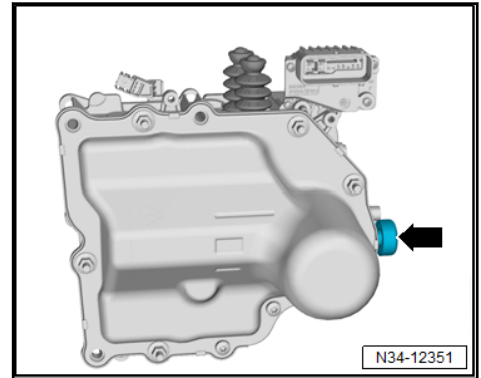
- Clean the area -1- around the clutch positioner with cleaning solution or using a flushing bottle -2- with soap. Remove stubborn dirt with a brush. Then thoroughly clean using a lint-free cloth in the area -1- again.



Note

Before turning the Mechatronic make sure that the breather -arrow- is sealed tightly.

- Turn the Mechatronic on its side so that the clutch positioner points upward.

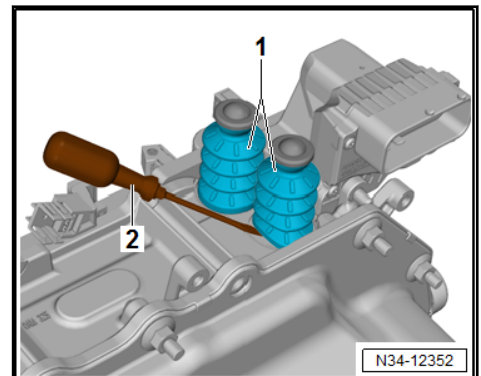


- Remove the boot -1- from the Mechatronic using a screwdriver -2-.



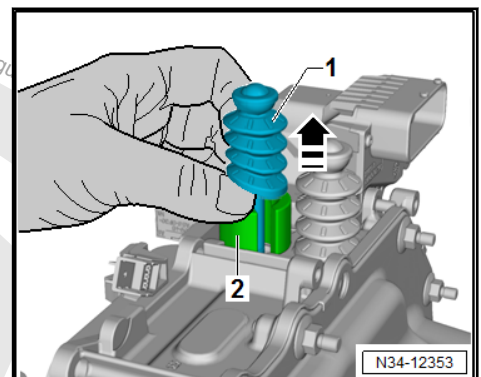
Note

Thoroughly clean the guide bushing before each step because any contamination can later lead to leaks.



- Place the guide bushing -2- on the Mechatronic as shown with the large opening upward and hold with a hand. With another hand remove the clutch positioner -1- until it stops.
- Remove the guide bushing carefully. At the same time the clutch positioner -1- must not be removed further.

The same procedure on the other clutch positioner.



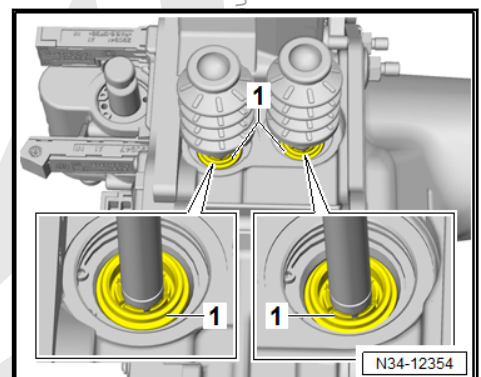
Note

Next a test takes place which decides the further procedure.

- Check the area around the clutch positioner -1- for leaks.

If the area -1- around the clutch positioner is dry continue as follows. Refer to ➤ [page 79](#) .

If the area is oiled, for the following steps the oil is first drained from the Mechatronic. Refer to ➤ [“9.2 Mechatronic Hydraulic Fluid, Draining and Filling”](#), page 157 .



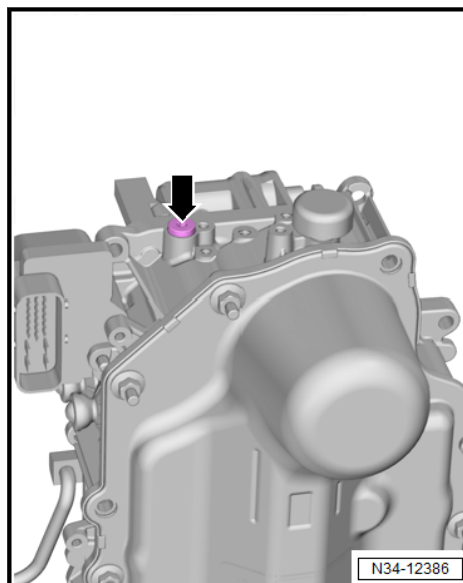
Note

Fill the new hydraulic fluid after all the following procedures are completed.

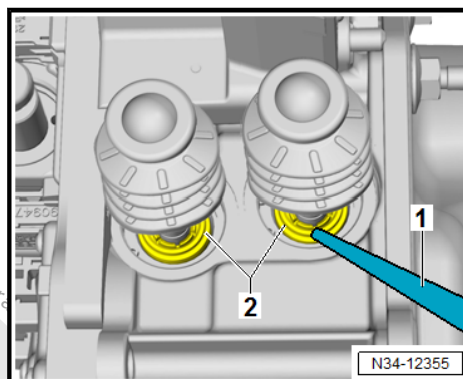
Continuation for All



- Position the Mechatronic so that the oil filler plug -arrow- points upward.



- Clean the area around the seals -2- with a cleaning solution or use the flushing bottle -1- with soap. Then let the soap drip and if necessary use a lint-free cloth to dry.



- Place the Mechatronic on its side so that the clutch positioner points upward. Pay attention that the bleeder -arrow- is sealed tightly.



Note

For all procedures the highest level of care and cleanliness is extremely important. At the same time pay attention when removing the clutch positioner that no dirt enters the opening.

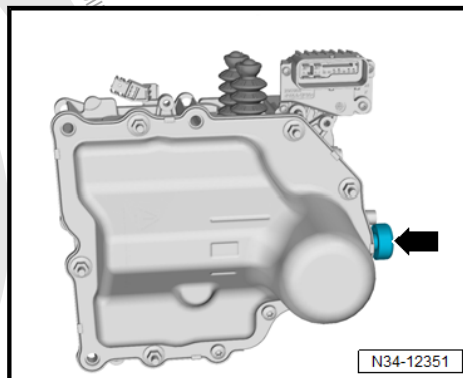
- Remove both clutch positioners from the Mechatronic.

Installing



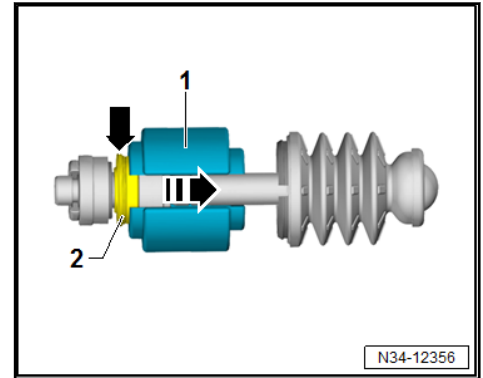
Note

Thoroughly clean the guide bushing before each step because any contamination can later lead to leaks.

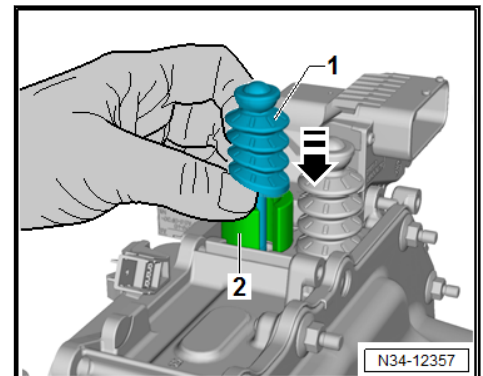




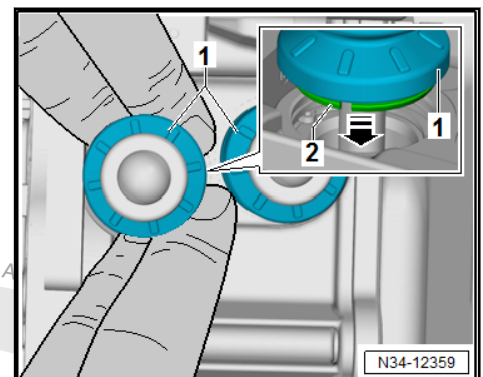
- Coat the sealing lip -arrow- of the seal -2- lightly with oil and push in the guide bushing -1- all the way.



- Place the clutch positioner -1- with the guide bushing -2- carefully on the Mechatronic opening. Hold the guide bushing with a hand and push the clutch positioner with the other hand approximately 30 mm in the Mechatronic.
- Remove the guide bushing carefully. At the same time the piston must not be removed further.
- Push the clutch positioner carefully back into the Mechatronic until the boot contacts the opening.



- Engage the boot -1- with the catch -2- with four fingers in the Mechatronic.
- Install the other clutch positioner in the same way.

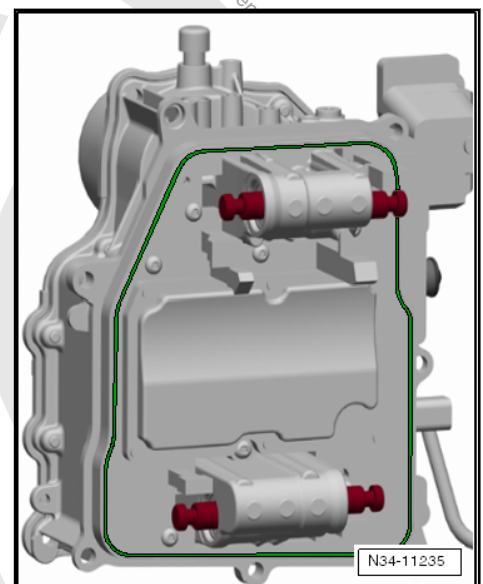


- Remove the old seal from the Mechatronic and clean the seal groove -shown in green- before installing a new seal.



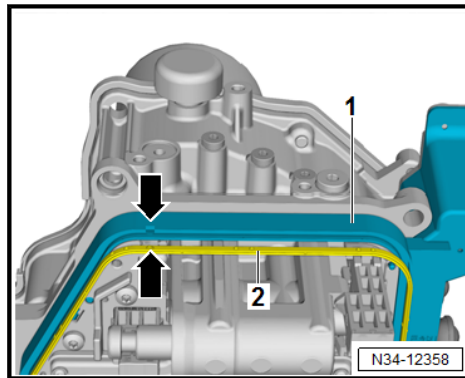
Note

The seal only fits in one position.





- Install the new seal in the Mechatronic groove all around. The recess on the seal -lower arrow- must align with the recess on the Mechatronic -upper arrow-.
- Refill the oil if it was drained from the Mechatronic. Refer to ⇒ [“9.2 Mechatronic Hydraulic Fluid, Draining and Filling”](#), [page 157](#) .
- Install the Mechatronic. Refer to ⇒ [“1.2 Mechatronic, Removing and Installing”](#), [page 56](#) .





2 Selector Mechanism

⇒ [“2.1 Overview - Selector Mechanism”, page 83](#)

⇒ [“2.2 Emergency Release from P”, page 85](#)

⇒ [“2.3 Selector Lever Handle, Removing and Installing”, page 86](#)

⇒ [“2.4 Button in Handle, Moving Into Installation Position”, page 87](#)

⇒ [“2.5 Selector Mechanism, Removing and Installing”, page 89](#)

⇒ [“2.6 Gearshift Mechanism, Checking”, page 98](#)

⇒ [“2.7 Selector Lever Cable, Checking and Adjusting”, page 99](#)

⇒ [“2.8 Selector Shaft Seal, Replacing”, page 102](#)

2.1 Overview - Selector Mechanism



WARNING

Move the selector lever into “P” and set the parking brake before working with the engine running.





6 - Cable Mounting Bracket

- ☐ For selector lever cable

7 - Bolt

- ☐ 8 Nm +90° turn
- ☐ Replace after removing
- ☐ For attaching the cable bracket to the transmission
- ☐ Quantity: 3

8 - Bolt

- ☐ 10 Nm +90°
- ☐ Replace after removing
- ☐ For the transmission shift lever

9 - Gearshift Lever

10 - Lock Washer

- ☐ For attaching the selector lever cable to the cable bracket
- ☐ Always replace



Note

The lock washer fit very tightly on the cable bracket. If necessary, remove the cable bracket and selector lever cable from the transmission. Refer to [⇒ page 92](#).

11 - Bolt

- ☐ 13 Nm
- ☐ Selector lever cable adjusting screw

12 - Tunnel/Body

2.2 Emergency Release from P

Do Not Remove the Handle

- ◆ The Shift Lock Solenoid - N110- locks the selector lever in the position "P". The selector lever can be shifted out of "P" with ignition on or motor start, separate brake pedal and pressed button on the selector lever head. Refer to [⇒ "2.6 Gearshift Mechanism, Checking", page 98](#).
- ◆ It is not possible to move the selector lever out of "P" if the voltage supply to the Shift Lock Solenoid - N110- is interrupted (the battery is discharged or a fuse is faulty) or if the solenoid is faulty. The vehicle cannot be moved because the parking lock is set.

If this is not the case:

- Check the fuses. Refer to [⇒ Wiring diagrams, Troubleshooting & Component locations](#).
- Check the battery voltage. Refer to [⇒ Electrical Equipment; Rep. Gr. 27 ; Battery; Battery, Checking](#).



Note

If the selector lever still cannot switch out of "P", the emergency release of the solenoid must be executed. If the selector lever is then switched back into "P", this is locked again in the position "P".

Procedure

- Unclip the selector lever cover and move it to the side.
- Press the brake or set the parking brake.
- Push onto the yellow plastic part in direction of -arrow-.



Caution

The selector mechanism could get damaged.

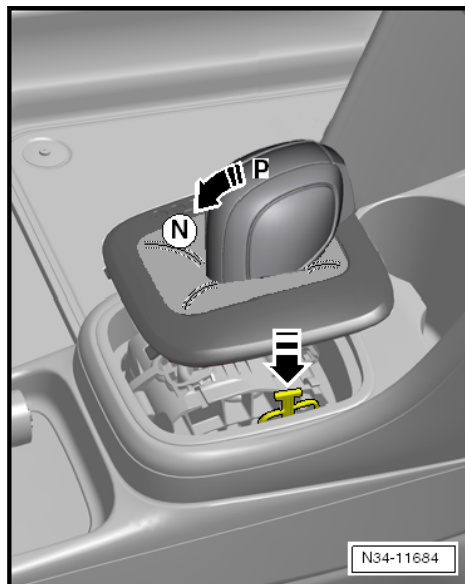
- ◆ *The selector mechanism must be replaced completely if any of its components are damaged.*

- The solenoid releases the selector lever.
- When the solenoid is free, press the button in the selector lever handle and move the selector lever out of "P".



Note

If the selector lever is not switched back into "P", the solenoid for the shift block will be automatically blocked in the position "P". The solenoid must be released again.



2.3 Selector Lever Handle, Removing and Installing

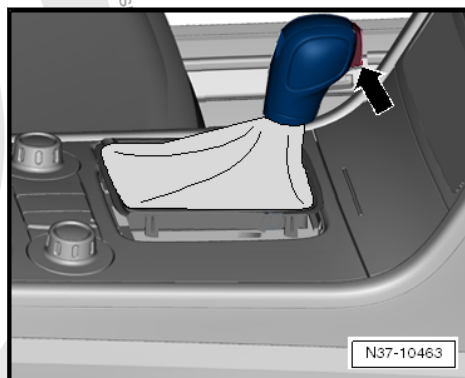
Special tools and workshop equipment required

- ◆ Trim Removal Wedge - 3409-

Removing

The handle and selector lever cover are removed.

- Move the selector lever into "D".
- Turn off the ignition.
- Unclip the cover on both sides using Trim Removal Wedge - 3409- and remove it.
- Remove the connector from the selector lever cover.
- Push the sleeve upward in direction of -arrow- to unlock the handle.





- Pull the selector lever handle and cover upward without pressing the button.

Installing

Install in reverse order of removal. Note the following:

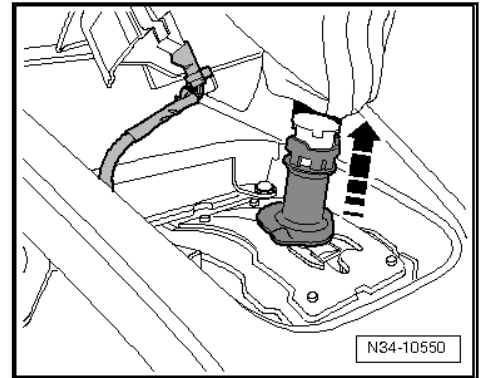
- The selector lever is in the “D” position.



Caution

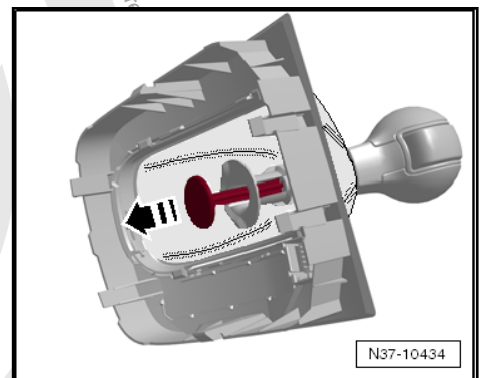
The selector mechanism could get damaged.

- ◆ *The button on the selector lever handle must be extended when installing. If the button should get pushed in unintentionally while the selector lever handle is removed, then it must be brought back into its installation position. Refer to ➔ [“2.4 Button in Handle, Moving Into Installation Position”, page 87](#).*
- ◆ *The selector lever handle and the pull rod -3- on the selector mechanism will get damaged if the selector lever handle is installed with the button pushed in.*



Note

- ◆ *A new handle is delivered with an assembly fastener. Pull out the safety catch in direction of -arrow- just before installing the new handle.*
- ◆ *The installed position can be set again using the assembly safety catch. Refer to ➔ [“2.4 Button in Handle, Moving Into Installation Position”, page 87](#).*
- Push the selector lever handle -1- all the way onto the selector lever without pushing the button while doing this.
- Lock the handle again after installing it. Push the sleeve downward under the handle.
- Press the button after installing it.



Note

If the button stays in the handle after being pressed, this means it was installed incorrectly. If this happens, remove the handle again and move the button in the installation position again. Refer to ➔ [“2.4 Button in Handle, Moving Into Installation Position”, page 87](#). Then install the handle again.

- Fold the boot downward and attach it.
- Check the selector mechanism. Refer to ➔ [“2.6 Gearshift Mechanism, Checking”, page 98](#).

2.4 Button in Handle, Moving Into Installation Position

If the button was pushed in by mistake, the installed position can be set again.

There are two ways to move the button into the installation position, »with« or »without« assembly fastener. The following describes both ways.



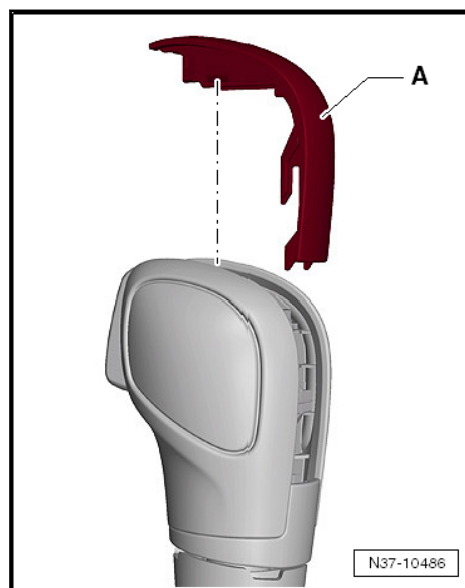
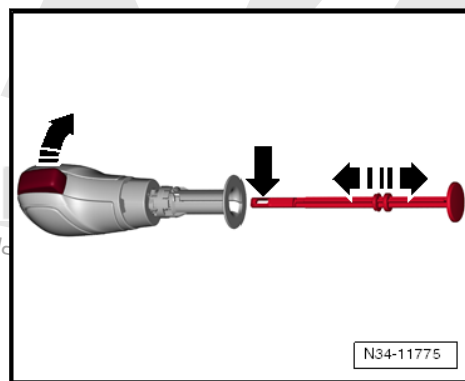
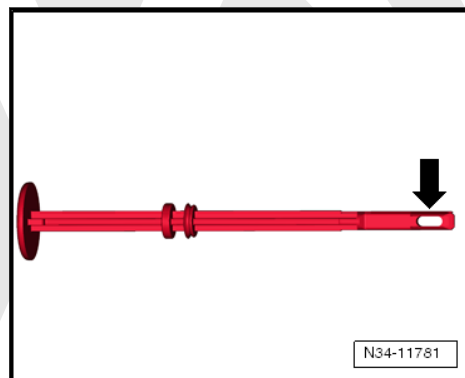
Moving the Handle »with« an Assembly Fastener into the Installation Position

Make sure the assembly fastener has an eye -arrow- at the front. Other assembly fasteners cannot be used.

- Press the button and push the assembly fastener (with the eye) -arrow- all the way in until it latches into place. Then release the button. The button locks into the installation position when the assembly fastener is pulled out.

Moving the Handle »without« an Assembly Fastener into the Installation Position

- Remove the trim -A- from the handle.



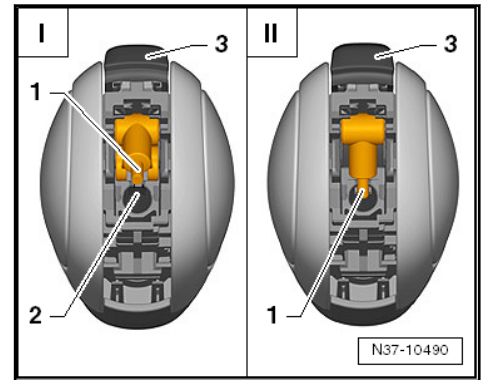


- Push the small lever -1- into the groove -2- with a screwdriver. This pushes the button -3- into the installation position.
- I- the button is in the pressed position
- II- the button is in the installation position



Note

- ◆ Push the lever into the groove and no further.
- ◆ Install the trim back onto the selector mechanism only after the handle is installed. This way it is possible to see if the small lever fits into the pull rod when the button is pushed.



2.5 Selector Mechanism, Removing and Installing

⇒ ["2.5.1 General Information", page 89](#)

⇒ ["2.5.2 Selector Mechanism with Selector Housing, Removing and Installing", page 89](#)

⇒ ["2.5.3 Selector Mechanism without Selector Housing, Removing and Installing", page 94](#)

2.5.1 General Information

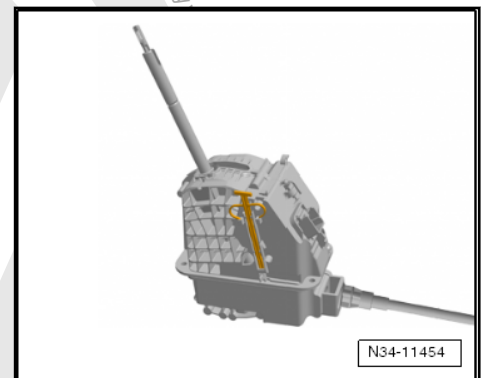
Special tools and workshop equipment required

- ◆ Pry Lever - 80-200-



Note

- ◆ The selector mechanism and the selector lever cable cannot be separated from each other. Both are removed at the same time.
- ◆ After installation, the selector lever cable movement must be checked and adjusted.



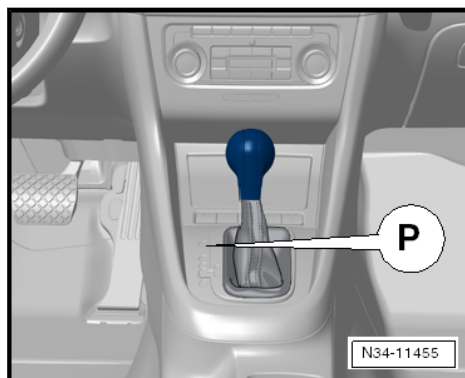
2.5.2 Selector Mechanism with Selector Housing, Removing and Installing

It is possible to remove and install the selector mechanism with selector lever cable alone without the selector housing. Refer to ["2.5.3 Selector Mechanism without Selector Housing, Removing and Installing", page 94](#).

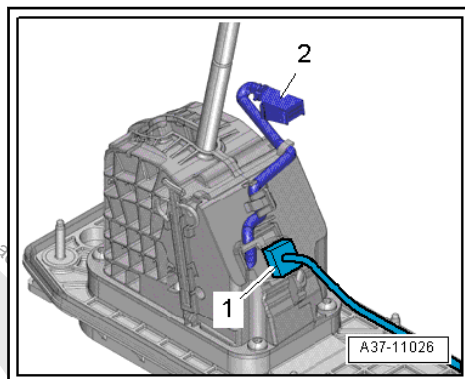


Removing

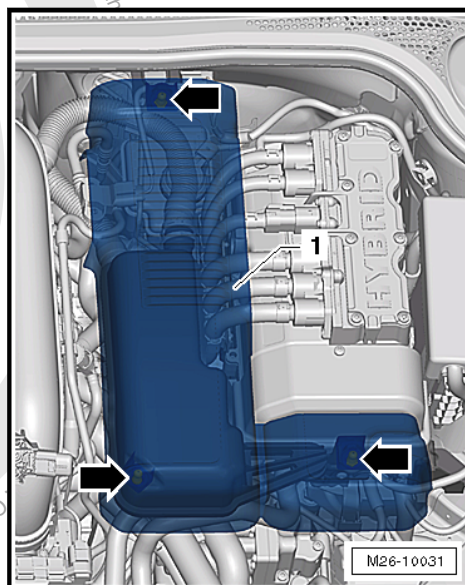
- Move the selector lever into “P”.



- Remove the selector lever handle. Refer to ⇒ [“2.3 Selector Lever Handle, Removing and Installing”, page 86](#) . Disconnect the connector -2- from the cover while doing this.
- Remove the center console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Center Console, Removing and Installing .
- Disconnect the connector -1- from the selector mechanism to the vehicle wiring harness.

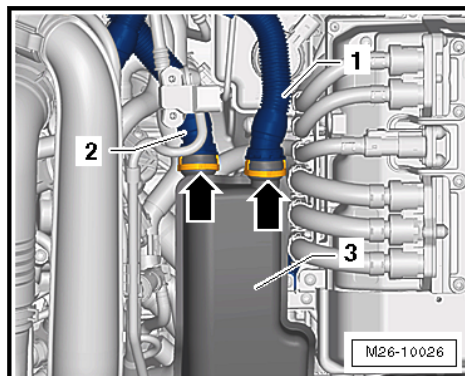


- Unclip and remove the damper cover -1- upward from the retainers -arrows-.



Vehicles with Secondary Air Injection (AIR) System

- Squeeze the locking ring -arrows- on both sides and remove the air lines -1 and 2- from the damper -3-.





- Remove the damper -1- upward from the rubber bushings -arrows-.

For All Vehicles



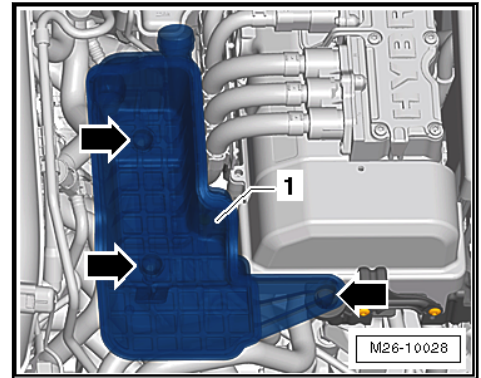
WARNING

Beware of the danger of electrocution.

An electrical shock can result in death.

Follow the High Voltage System General Warnings. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System General Warnings .

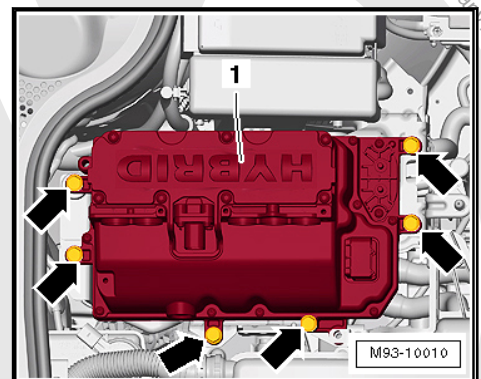
- ◆ *A high voltage technician must de-energize the high voltage system before any work can be performed on the high voltage system or before any servicing work can be performed on the body.*
- ◆ *Only hybrid electrically instructed persons may perform all work on a vehicle with a high voltage system. All work must be performed by a high voltage technician.*



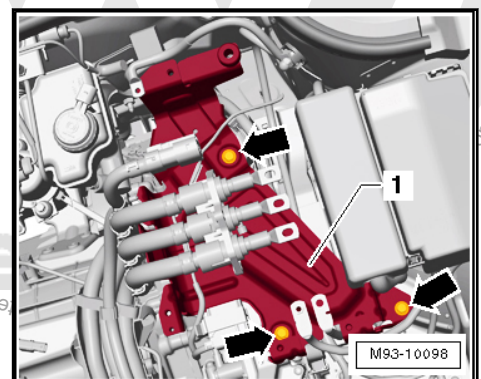
WARNING

High voltage at the high voltage system of the hybrid vehicle. Danger of electrocution! The following procedure requires work on the high voltage system. To de-energize the high voltage system. Refer to ⇒ Hybrid Electrical System; Rep. Gr. 93 ; High Voltage System, De-energizing .

- Remove the Electric Drive Power and Control Electronics - JX1- . Refer to ⇒ Electrical Equipment; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .



- Remove the bracket -1- for the Electric Drive Power And Control Electronics - JX1- -arrows-. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage Cables; High Voltage Battery High Voltage Cable Set, Removing and Installing .

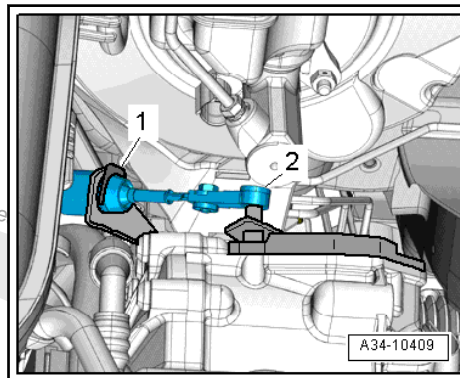




- Remove the lock washer -1- from the selector lever cable.

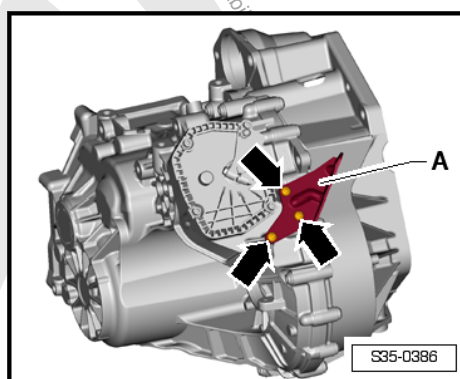
Always replace the circlip on the selector lever cable.

- Remove the selector lever cable -2- from the selector lever, for example, with Pry Lever - 80-200- .



Note

- ◆ Use pliers to remove the lock washer -1-. Do not use a sharp-edged lever. Otherwise the selector lever cable could get damaged.
- ◆ Remove the cable bracket -A- and selector lever cable from the transmission, if necessary. To do this, remove the bolts -arrows-. These bolts must be replaced.
- ◆ Bolt tightening specification -arrows- -item 7- ⇒ [Item 7 \(page 85\)](#) .



Caution

Danger of damaging the selector lever cable.

- ◆ Push the selector lever cable to the rear and out of the cable bracket. Guide the selector lever cable out of the cable bracket when removing the selector mechanism.



- Lift the vehicle.
- Remove the front and rear tunnel braces from the body. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Tunnel Bridge .
- Remove the exhaust pipe under the center tunnel heat shield. Refer to ⇒ Rep. Gr. 26 ; Emissions Control; Overview - Emissions Control .
- Disconnect the center and rear mufflers from the retaining straps and tie them to the body with wire. Refer to ⇒ Rep. Gr. 26 ; Exhaust Pipes/Mufflers; Overview - Muffler .
- Remove the center tunnel heat shield under the selector mechanism.



Note

A second technician is required under the vehicle to remove the selector mechanism.



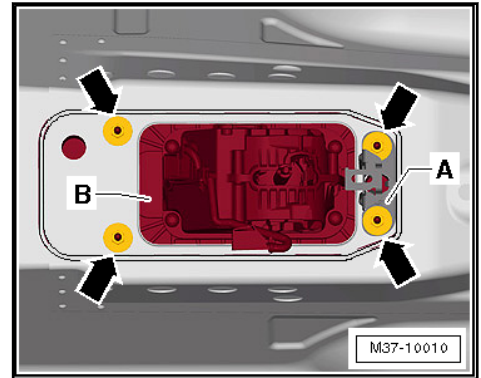
- Remove the nuts -arrows- in the vehicle interior.
- Remove the bracket -A-, if equipped.
- Remove the selector mechanism -B- with the selector lever cable and selector housing downward. Guide the selector lever cable out of the cable bracket at the same time.



Caution

Danger of damaging the selector lever cable.

- ◆ ***Do not bend or kink the selector lever cable.***



Installing

Install in reverse order of removal. Note the following:



Note

Do not lubricate the selector lever cable.



Caution

Danger of damaging the selector lever cable.

- ◆ ***Do not bend or kink the selector lever cable.***

- Install the heat shield under the shift mechanism.
- Install the exhaust system and align it free of tension. Refer to ⇒ Rep. Gr. 26 ; Emissions Control; Overview - Emissions Control .
- Attach the front and rear tunnel braces to the body. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Tunnel Bridge .
- Install the center console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Center Console, Removing and Installing .
- Install the selector lever handle. Refer to ⇒ [“2.3 Selector Lever Handle, Removing and Installing”, page 86](#) .
- Adjust the selector lever cable. Refer to ⇒ [“2.7 Selector Lever Cable, Checking and Adjusting”, page 99](#) .
- Check the selector mechanism. Refer to ⇒ [“2.6 Gearshift Mechanism, Checking”, page 98](#) .
- Install the Electric Drive Power and Control Electronics - JX1- . Refer to ⇒ Electrical Equipment; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .
- Energize the high voltage system and complete the required documentation. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System, Energizing .

Tightening Specifications

- ◆ Refer to ⇒ [“2.1 Overview - Selector Mechanism”, page 83](#)

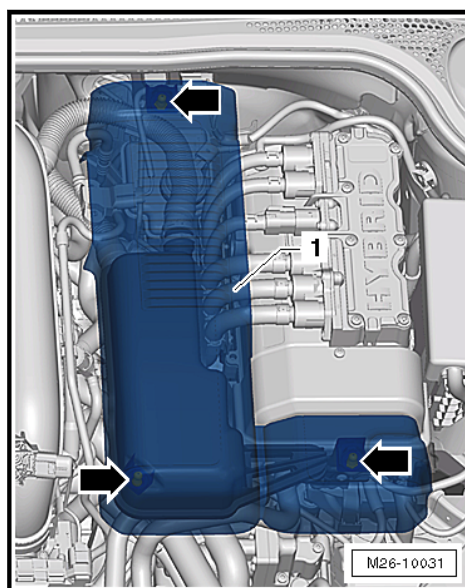
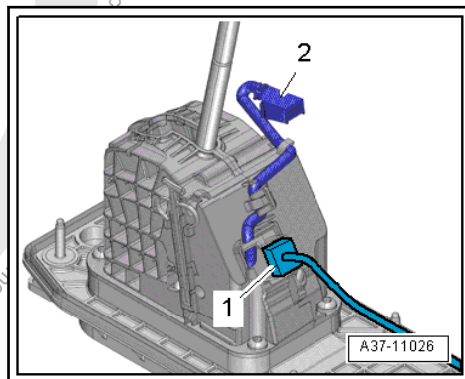
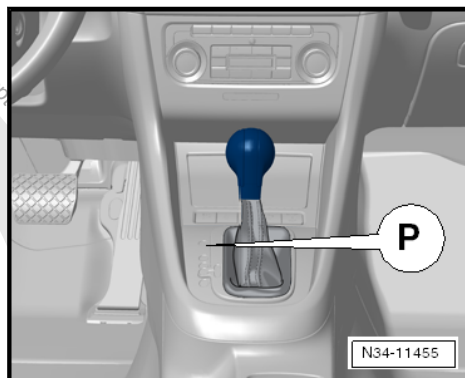


2.5.3 Selector Mechanism without Selector Housing, Removing and Installing

The selector mechanism with selector lever cable can be removed and installed together with the selector housing. Refer to ⇒ [“2.5.2 Selector Mechanism with Selector Housing, Removing and Installing”, page 89](#) .

Removing

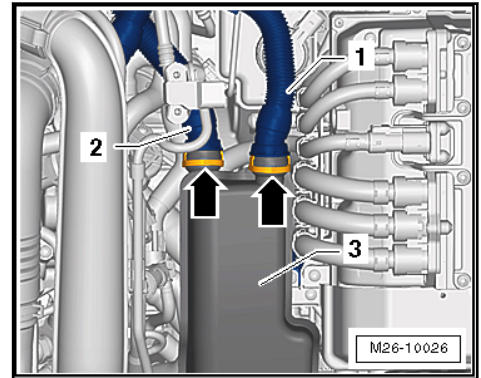
- Move the selector lever into “P”.
- Remove the selector lever handle. Refer to ⇒ [“2.3 Selector Lever Handle, Removing and Installing”, page 86](#) . Disconnect the connector -2- from the cover while doing this.
- Remove the center console. Refer to ⇒ Body Interior; Rep. Gr. 68 ; Center Console; Center Console, Removing and Installing .
- Disconnect the connector -1- from the selector mechanism to the vehicle wiring harness.
- Unclip and remove the damper cover -1- upward from the retainers -arrows-.



Vehicles with Secondary Air Injection (AIR) System



- Squeeze the locking ring -arrows- on both sides and remove the air lines -1 and 2- from the damper -3-.



- Remove the damper -1- upward from the rubber bushings -arrows-.

For All Vehicles



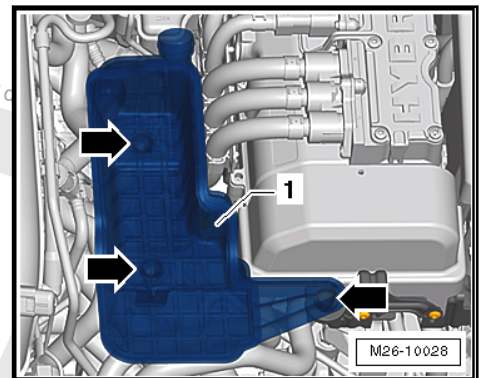
WARNING

Beware of the danger of electrocution.

An electrical shock can result in death.

Follow the High Voltage System General Warnings. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System General Warnings .

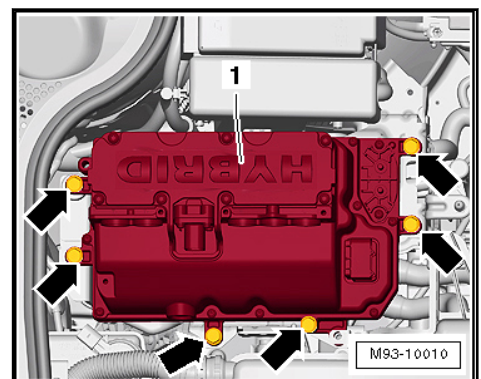
- ◆ ***A high voltage technician must de-energize the high voltage system before any work can be performed on the high voltage system or before any servicing work can be performed on the body.***
- ◆ ***Only hybrid electrically instructed persons may perform all work on a vehicle with a high voltage system. All work must be performed by a high voltage technician.***



WARNING

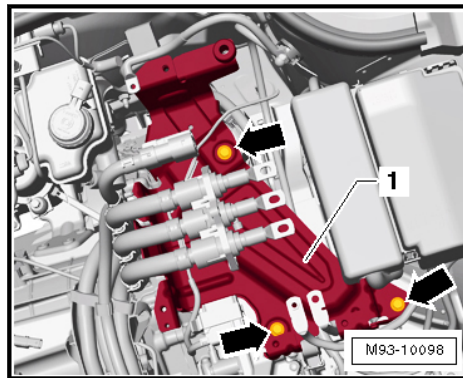
High voltage at the high voltage system of the hybrid vehicle. Danger of electrocution! The following procedure requires work on the high voltage system. To de-energize the high voltage system. Refer to ⇒ Hybrid Electrical System; Rep. Gr. 93 ; High Voltage System, De-energizing .

- Remove the Electric Drive Power and Control Electronics - JX1- . Refer to ⇒ Electrical Equipment; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .





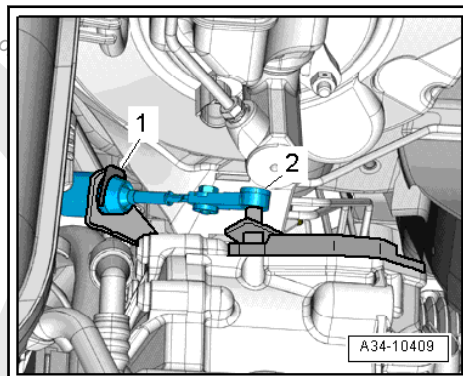
- Remove the bracket -1- for the Electric Drive Power And Control Electronics - JX1- -arrows-. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage Cables; High Voltage Battery High Voltage Cable Set, Removing and Installing .



- Remove the lock washer -1- from the selector lever cable.

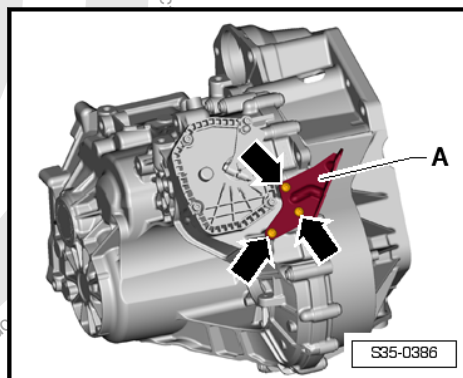
Always replace the circlip on the selector lever cable.

- Remove the selector lever cable -2- from the lever/gearshift shaft, for example, with Pry Lever - 80-200- .



Note

- ◆ Use pliers to remove the lock washer -1-. Do not use a sharp-edged lever. Otherwise the selector lever cable could get damaged.
- ◆ Remove the cable bracket -A- and selector lever cable from the transmission, if necessary. To do this, remove the bolts -arrows-. These bolts must be replaced.
- ◆ Bolt tightening specification -arrows- -item 7- [Item 7 \(page 85\)](#) .



Caution

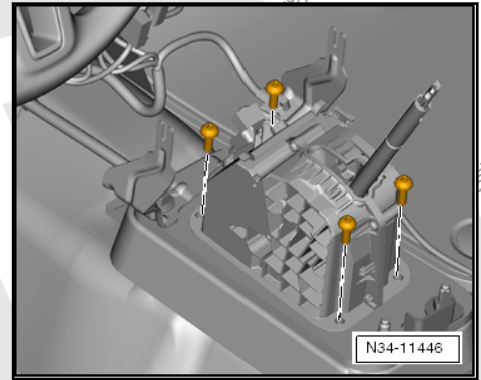
Danger of damaging the selector lever cable.

- ◆ Push the selector lever cable to the rear and out of the cable bracket. Guide the selector lever cable out of the cable bracket when removing the selector mechanism.

- Attach a longer cord to the end of the cable. The cord is used to guide the cable between the tunnel and the heat shield during installation.



- Remove the 4 bolts attaching the selector mechanism to the selector housing.
- Pull the selector mechanism and cable out of the center tunnel in direction of -arrow-. Make sure the cord is pull through far enough so that it can reached from inside the engine compartment.



- Remove the cord from the cable.

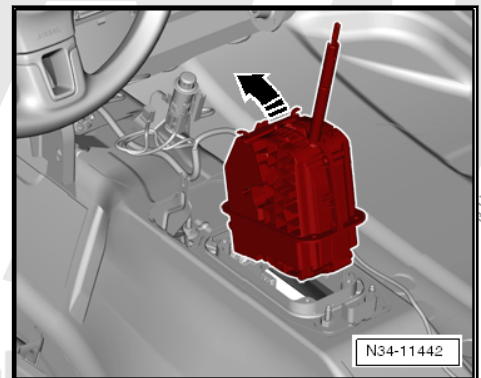
Installing

Install in reverse order of removal. Note the following:



Note

- ◆ *A second technician will be needed for inserting the cable from the passenger compartment into the engine compartment.*
- ◆ *Do not lubricate the selector lever cable.*



Caution

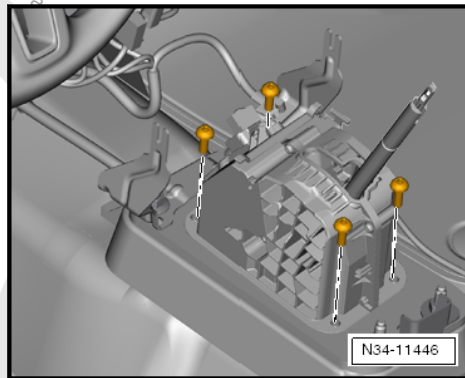
Danger of damaging the selector lever cable.

- ◆ ***Do not bend or kink the selector lever cable.***

- Secure the cord to the end of the cable.
- Guide the selector mechanism and cable through the opening in the center tunnel.
- From the engine compartment, the second technician pulls the cord with the cable through the tunnel until it is possible to attach the cable to the support bracket.
- Remove the cord from the cable.



- Attach the selector mechanism to the selector housing with four bolts.
- Install the center console. Refer to ➤ Body Interior; Rep. Gr. 68 ; Center Console; Center Console, Removing and Installing
- Install the selector lever handle. Refer to ➤ [“2.3 Selector Lever Handle, Removing and Installing”, page 86](#) .
- Adjust the selector lever cable. Refer to ➤ [“2.7 Selector Lever Cable, Checking and Adjusting”, page 99](#) .
- Check the selector mechanism. Refer to ➤ [“2.6 Gearshift Mechanism, Checking”, page 98](#) .
- Install the Electric Drive Power and Control Electronics - JX1- . Refer to ➤ Electrical Equipment; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .
- Energize the high voltage system and complete the required documentation. Refer to ➤ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System, Energizing .



Tightening Specifications

- ◆ Refer to ➤ [“2.1 Overview - Selector Mechanism”, page 83](#)

2.6 Gearshift Mechanism, Checking

Use [Guided Fault Finding](#) to determine electric faults. A mechanical fault or a faulty system or a faulty part must be found and repaired.

It is not possible to start the engine when the selector lever is in “R”, “D” and “S” or in the tiptronic position.

If selector lever position “N” is selected at speeds greater than 5 km/h, the shift lock solenoid must not engage and block the selector lever. The selector lever can be moved into another gear.

The shift lock solenoid must engage after approximately 1 second only at speeds below 5 km/h (almost standstill) and when the selector lever is moved into “N”. The selector lever can be moved out of “N” only when the brake pedal is pressed.

Selector Lever in “P” and the Ignition Turned On:

- If the brake pedal is not depressed:

The selector lever is locked and cannot be moved out of “P” when the locking button is pressed. The shift lock solenoid blocks the selector lever.

- If the brake pedal is depressed:

The shift lock solenoid releases the selector lever. It is possible to shift into a gear. Slowly move the selector lever slowly from “P” through “S”; while doing this, check whether display of selector lever position in instrument panel insert matches actual selector lever position.

The Selector Lever is in “N” and the Ignition Is Turned On

- If the brake pedal is not depressed:

The selector lever is locked and cannot be moved out of “N” when the button is pressed. The shift lock solenoid blocks the selector lever.

- If the brake pedal is depressed:



The shift lock solenoid releases the selector lever. It is possible to shift into a gear.

Selector Level in the "tiptronic" Position

- Move the selector lever into the tiptronic gate.

"P R N D S" must change to "7 6 5 4 3 2 1".

The Ignition and Lights Must Be Turned On

The appropriate symbol is being lit up in shift mechanism cover.

Transmission Range Display

Simultaneous lighting of all segments of transmission range selector lever display indicates transmission is in emergency running mode.

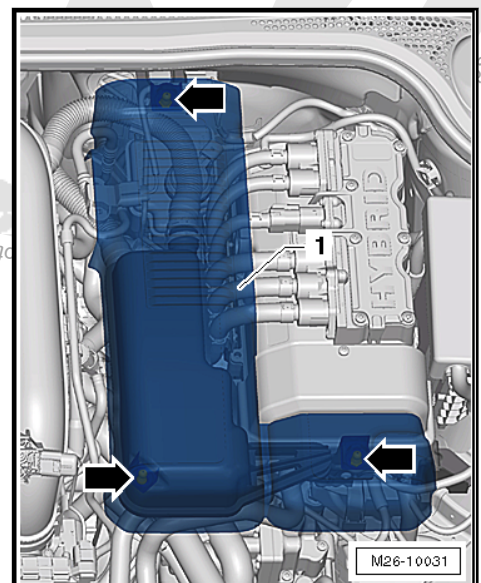
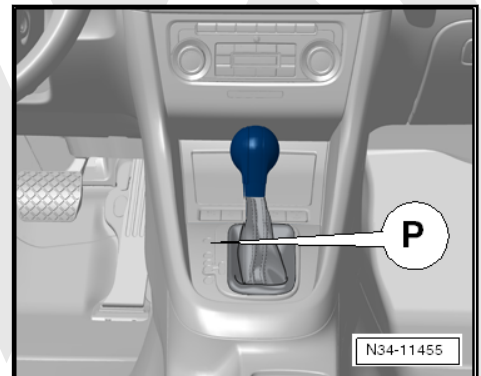
2.7 Selector Lever Cable, Checking and Adjusting

Selector lever cable must be adjusted if:

- ◆ The selector lever cable was removed from the transmission.
- ◆ The engine and transmission were removed and installed.
- ◆ The selector lever cable and the selector mechanism were removed and installed.
- ◆ Engine/transmission positions changes, for example, were installed free of tension.
- Move the selector lever into "P".

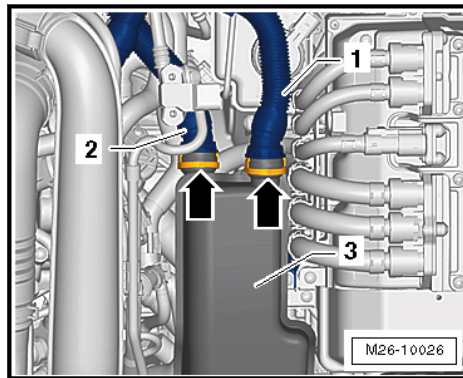
- Unclip and remove the damper cover -1- upward from the retainers -arrows-.

Vehicles with Secondary Air Injection (AIR) System





- Squeeze the locking ring -arrows- on both sides and remove the air lines -1 and 2- from the damper -3-.



- Remove the damper -1- upward from the rubber bushings -arrows-.

For All Vehicles



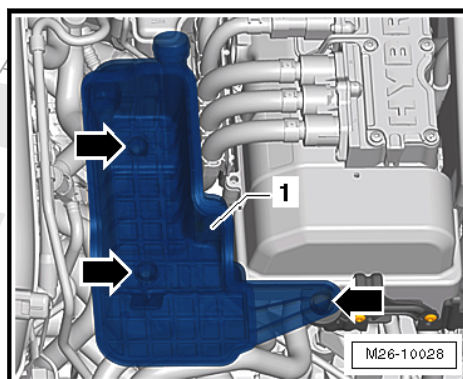
WARNING

Beware of the danger of electrocution.

An electrical shock can result in death.

Follow the High Voltage System General Warnings. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System General Warnings .

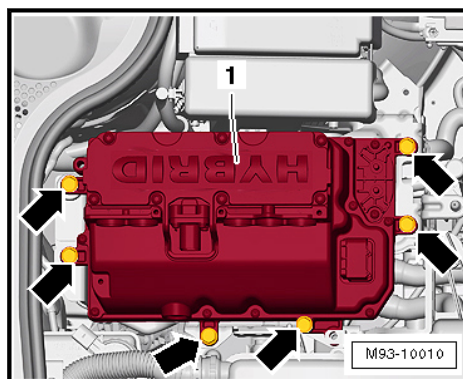
- ◆ **A high voltage technician must de-energize the high voltage system before any work can be performed on the high voltage system or before any servicing work can be performed on the body.**
- ◆ **Only hybrid electrically instructed persons may perform all work on a vehicle with a high voltage system. All work must be performed by a high voltage technician.**



WARNING

High voltage at the high voltage system of the hybrid vehicle. Danger of electrocution! The following procedure requires work on the high voltage system. To de-energize the high voltage system. Refer to ⇒ Hybrid Electrical System; Rep. Gr. 93 ; High Voltage System, De-energizing .

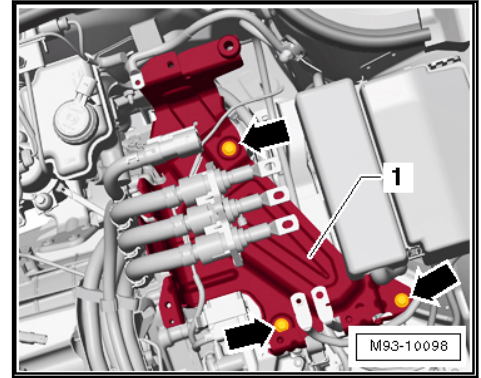
- Remove the Electric Drive Power and Control Electronics - JX1- . Refer to ⇒ Electrical Equipment; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .





- Remove the bracket -1- for the Electric Drive Power And Control Electronics - JX1- -arrows-. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage Cables; High Voltage Battery High Voltage Cable Set, Removing and Installing .

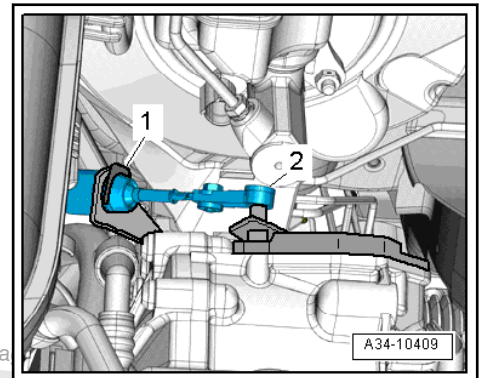
Selector Lever Cable, Checking



- Remove the selector lever cable -2- from the transmission selector lever using Pry Lever - 80-200- .
- Remove the lock washer -1- from the selector lever cable, if necessary.

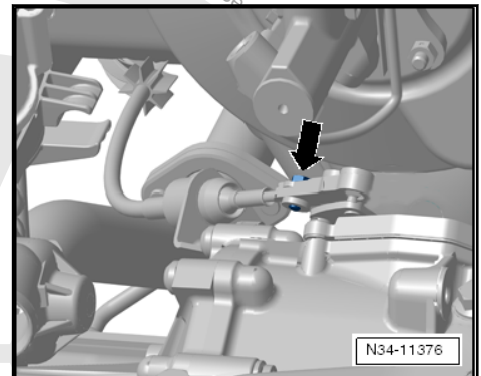
Always replace the circlip on the selector lever cable.

- Move the selector lever from »P« through »S« and back to »P« several times.
- Selector mechanism and selector lever cable move easily when shifting.
- The selector lever cable is undamaged.

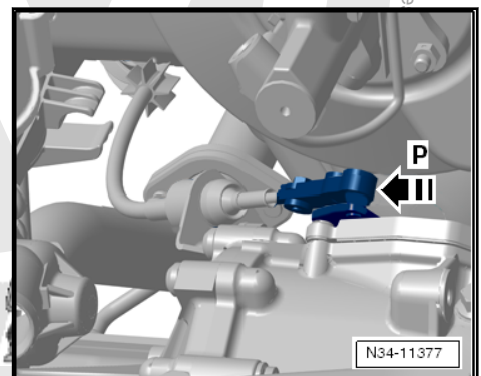


Selector Lever Cable, Adjusting

- Loosen the adjusting screw -arrow- on the selector lever cable.
- Shift the transmission gearshift lever into "P".



The selector lever must pushed all the way toward the right side of the vehicle, in the direction toward the selector lever cable bracket.





The illustration shows the transmission from the rear. **P** is toward the cable bracket.



WARNING

The parking lock must be engaged.



Note

Make sure the transmission is in "P" (parking lock is engaged) if raising the vehicle. It must not be possible to turn the front wheels.

- To release selector lever cable tension, carefully move selector lever front and back slightly but do not shift into another selector lever position.
- Tighten the adjusting screw -arrow-. The position of the selector lever cable must not change while doing this.

This ends the adjustment.

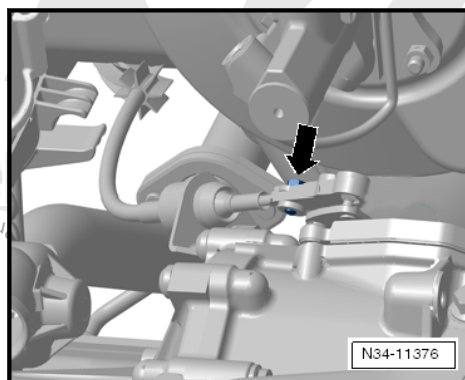
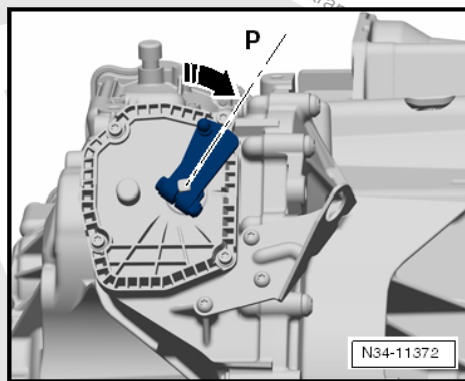
- The rest of the installation is performed in reverse order of removal. When doing this, install the Electric Drive Power and Control Electronics - JX1- . Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .
- Energize the high voltage system and complete the required documentation. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System, Energizing .

Tightening Specifications

- ◆ Selector lever cable adjusting screw. Refer to ⇒ ["2.1 Overview - Selector Mechanism", page 83](#)

2.8 Selector Shaft Seal, Replacing

The selector shaft seal can currently be replaced only together with the parking lock cover. Refer to ⇒ ["3.1 Parking Lock Cover, Removing and Installing", page 233](#) .





3 Transmission, Removing and Installing

⇒ [“3.1 Transmission, Removing”, page 103](#)

⇒ [“3.2 Transmission, Installing”, page 107](#)

⇒ [“3.3 Transmission Tightening Specifications”, page 111](#)

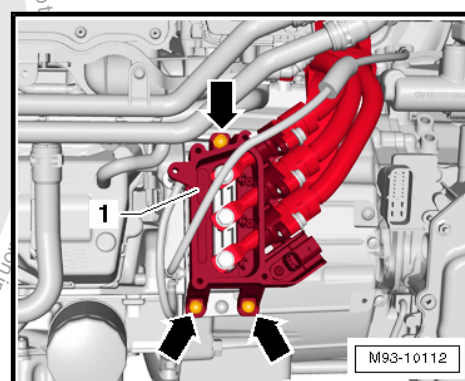
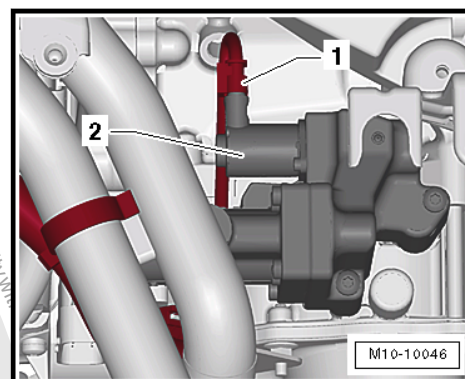
3.1 Transmission, Removing

Special tools and workshop equipment required

- ◆ Bits for VAG1331/13 - T10099-
- ◆ Socket - Xzn 14 - T10061-
- ◆ Engine/Gearbox Support Shackle (2 pc.) - 10-222A/12-
- ◆ Shop Crane - VAS6100-
- The transmission and engine are removed. Refer to ⇒ Rep. Gr. 10 ; Engine, Removing and Installing; Engine, Removing .

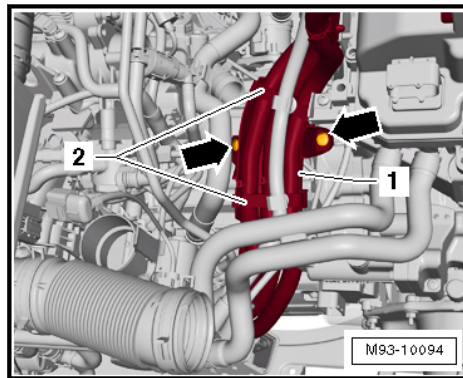
Removing Transmission from Engine

- The engine/transmission sub-assembly is removed with the Scissor Lift Table - VAS6131- .
- Disconnect the connector -1- from the valve -2- on the Mechatronic and pull the wiring harness from the front bracket on the transmission.
- Remove the Drive Motor High Voltage Wiring Harness - PX2- from the transmission together with the connection box. Refer to -1- -arrows-. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage Cables; Drive Motor High Voltage Wiring Harness, Removing and Installing .

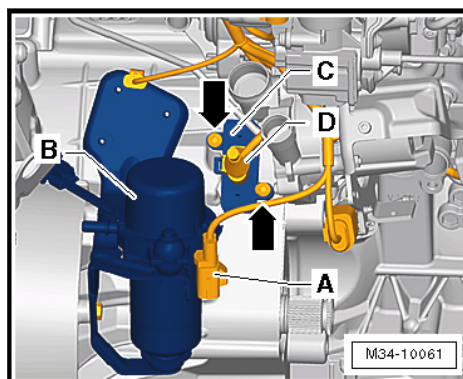




- Remove the cable bracket -1- for the Drive Motor High Voltage Wiring Harness - PX2- from the transmission -arrows-. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage Cables; Drive Motor High Voltage Wiring Harness, Removing and Installing .



- Unlock and disconnect the connector -A- from the Brake System Vacuum Pump - V192- -B-.
- Remove the bracket and Brake System Vacuum Pump - V192- -B- from the transmission and tie it up on the engine.
- Unlock and disconnect the connector -D- from Drive Motor Rotor Position Sensor 1 - G713- -C-.
- Remove the bolts -arrows- and Drive Motor Rotor Position Sensor 1 - G713- .



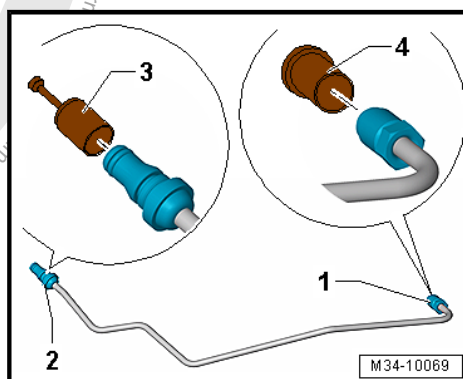
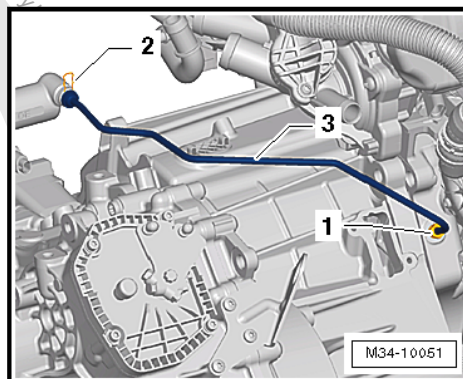
WARNING

Danger of dirt.

Always clean the connection locations and the area around them before loosening.

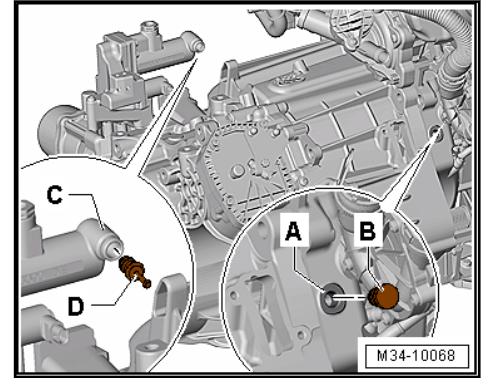
The Mechatronic hydraulic system is not open. Dirt can cause the system to malfunction.

- Remove the bolt -1- for the hydraulic line -3- on the engine.
- Remove the clamps -2- from the valve block/Mechatronic.
- Remove the hydraulic line -3- on the engine and valve block/ Mechatronic at the same time.





- Seal the hydraulic line connections -1 and 2- immediately with new sealing plugs -3 and 4- from the Repair Kit - 5C0 998 152- . Preferably the hydraulic fluid should remain in the line if possible, otherwise it should not become dirty.
- Seal the connections on the engine -A- and the valve block/ Mechatronic -C- with new sealing plugs -B and D- from the Repair Kit - 5C0 998 152- .
- Always use new plugs from the Repair Kit - 5C0 998 152- . Refer to the Parts Catalog. The sealing plugs cannot be used again.

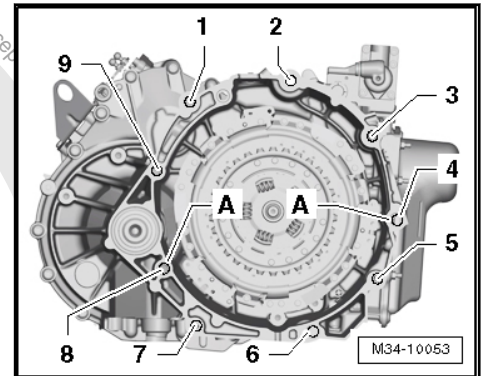


- Remove the bolts attaching the transmission to the engine -1 through 7-.



Note

- ◆ Loosen the bolts -3 and 4- with the Bit for VAG1331/13 - T10099/1- .
- ◆ Bolts -8 and 9- remain installed.

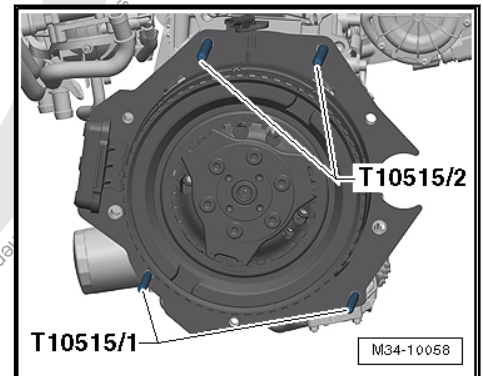


- Install the Centering Mandrel - T10515- into the engine, as illustrated.

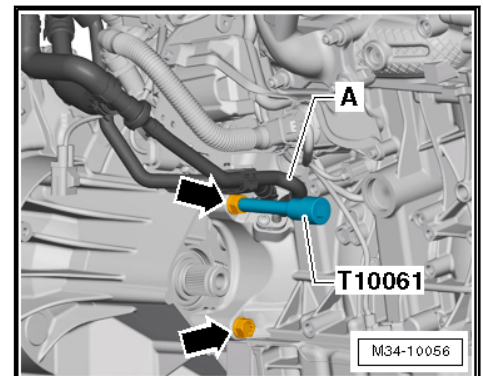


Note

The transmission is not shown in the illustration.

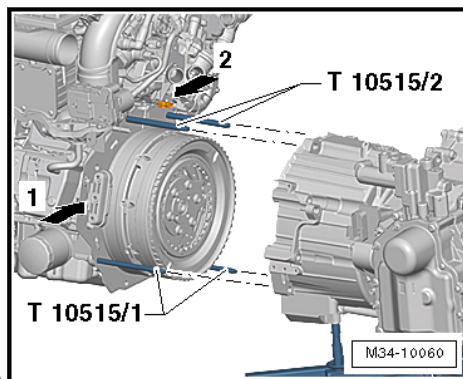


- Remove the engine/transmission connecting bolts -arrows- from the engine side. Use Socket - Xzn 14 - T10061- . Watch out for the coolant line -A- while removing the bolts.
- Separate the transmission from the alignment sleeves on the engine.



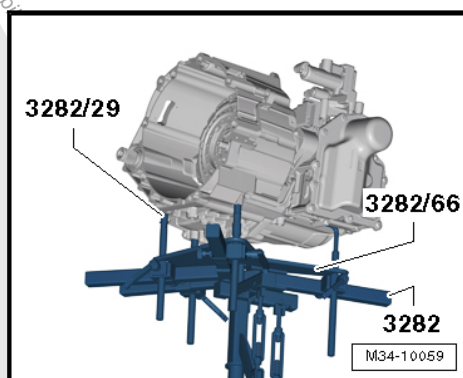


- Carefully pull the transmission off the engine. Be careful not to damage the connections -arrow 1- on the Electro-Drive Drive Motor - V141- and the Drive Motor Temperature Sensor - G712- -arrow 2-.



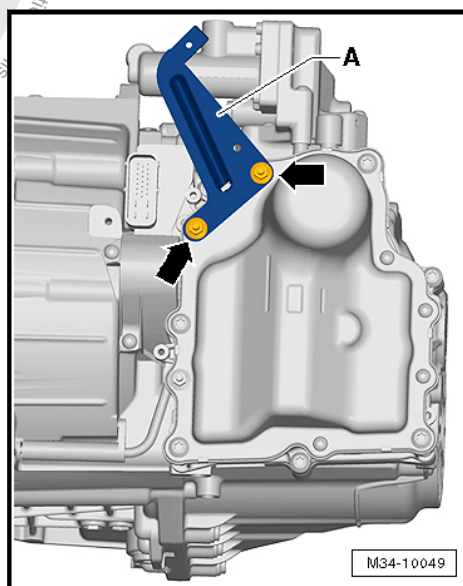
Note

It may be necessary to adjust the position of the transmission while removing it by turning the spindles on the Transmission Support - 3282- .

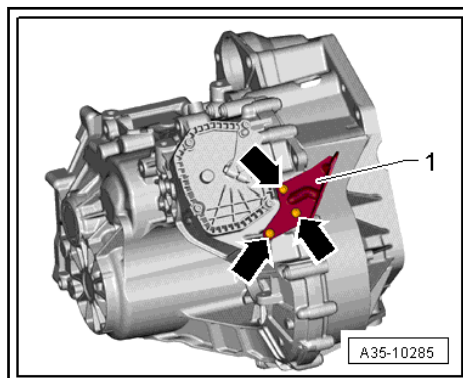


If the Transmission Is Going to be Shipped Somewhere

- Remove the front bracket -A- from the transmission -arrows-.



- Remove the cable bracket -1- from the transmission -arrows-, tightening specification. Refer to ["2.1 Overview - Selector Mechanism", page 83](#) .



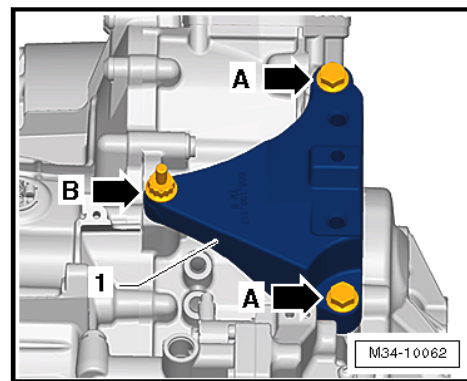


- Remove the transmission bracket -1- from the transmission -arrows A and B-, tightening specification. Refer to ➤ [“4.1 Overview - Subframe Mount”, page 112](#) .

Transmission, transporting. Refer to ➤ [“5 Transmission, Transporting”, page 121](#) .

Secure the transmission on the assembly stand. Refer to ➤ [“8 Securing on Engine and Transmission Holder”, page 152](#) .

Install the transmission. Refer to ➤ [“3.2 Transmission, Installing”, page 107](#) .



3.2 Transmission, Installing

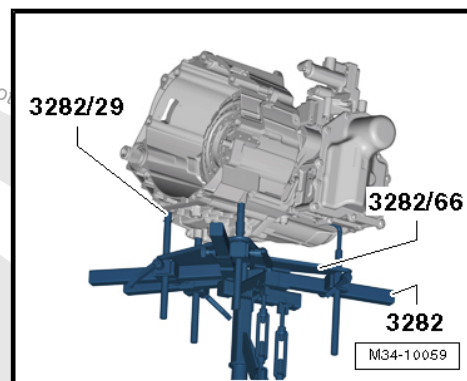
- Install the transmission together with the engine. Refer to ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Engine, Removing and Installing; Engine, Installing .

Attach the Transmission to the Engine As Follows:

- The Electro-Drive Drive Motor - V141- is attached to the engine.
- The Transmission Support - 3282- is installed in the Scissor Lift Table - W12 Engine Support - VAS6131/2- on the Scissor Lift Table - VAS6131- .
- Follow repair instructions. Refer to ➤ [“3 Repair Information”, page 6](#) .
- Refer to ➤ [“3.3 Transmission Tightening Specifications”, page 111](#)

Refer to “Transmission, Removing” to get a list of the special tools needed ➤ [“3.1 Transmission, Removing”, page 103](#) .

- Mount the transmission on the Transmission Support - 3282- and secure it.
- Check if the alignment sleeves for centering the engine/transmission are in the cylinder block and insert them if they are not.

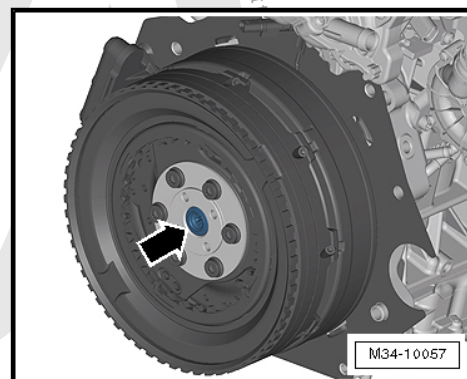


- Replace the needle bearing -arrow- in the Electro-Drive Drive Motor - V141- . Refer to ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Electro-Drive Drive Motor - V141- , Removing from Engine and ➤ Engine Mechanical, Fuel Injection and Ignition; Rep. Gr. 10 ; Electro-Drive Drive Motor - V141- , Installing on Engine .



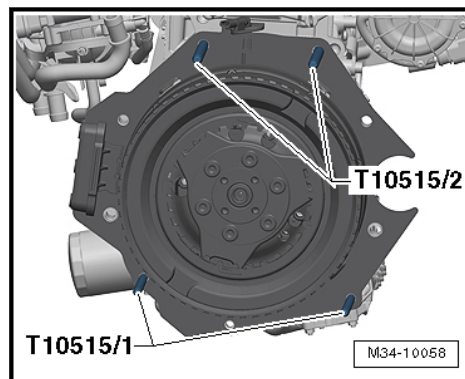
Note

The gears will no longer shift correctly if the needle bearing inside the Electro-Drive Drive Motor - V141- is damaged.





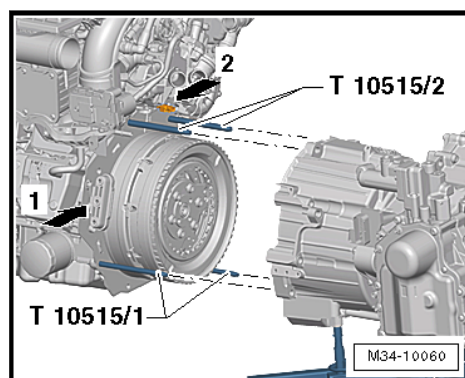
- Install the Centering Mandrel - T10515- into the engine, as illustrated.
- Align the transmission with the engine and then carefully push the transmission onto the engine. While doing this, turn the spindle on the Transmission Support - 3282- to adjust the position of the transmission.



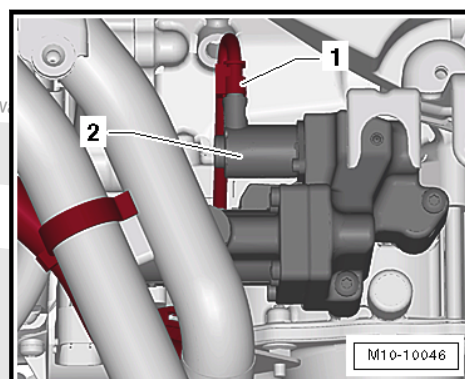
- Be careful not to damage the connections -arrow 1- on the Electro-Drive Drive Motor - V141- and on the Drive Motor Temperature Sensor - G712- -arrow 2-.
- Guide the engine and transmission together by hand until the entire surface of both flanges come into contact with one another.

Turn the crankshaft slightly if necessary.

- Attach the transmission to the engine and remove the Centering Mandrel - T10515- from the engine.
- If the transmission was replaced: attach the cable bracket, the transmission bracket and the bracket to the transmission. Refer to [page 106](#).

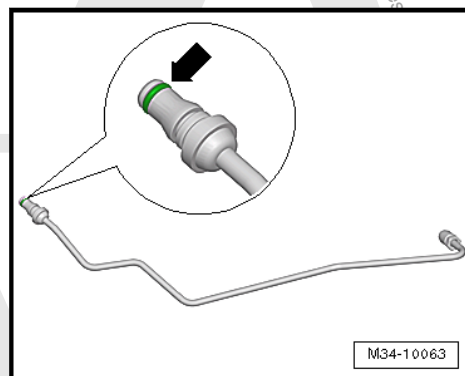


- Connect the connector -1- to the valve -2- on the Mechatronic and attach the wiring harness to the front bracket on the transmission.



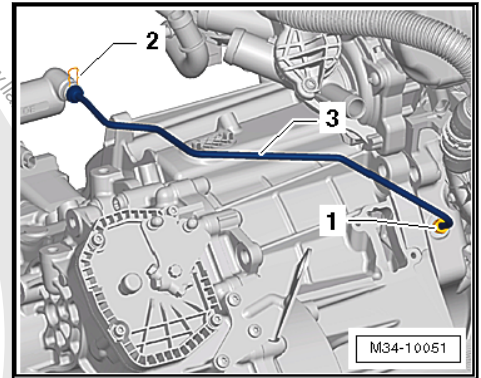
Note

- ◆ Check the O-ring -arrow- on the hydraulic line for damage and replace, if necessary. Refer to the Parts Catalog.
- ◆ The O-ring must appear green. It can be used with hydraulic fluid. Do not use any other O-ring.
- ◆ Remove and dispose of the sealing plugs on the hydraulic line as well as on the engine and valve block/Mechatronic just before installation. The sealing plugs cannot be used again.





- Install the hydraulic line -3- on the engine and valve block/ Mechatronic.
- Push the clamps -2- onto the valve block/ Mechatronic.
- Pull on the hydraulic pipe -3- to check it.
- Tighten the bolt -1- on the engine for the hydraulic line to the tightening specification.

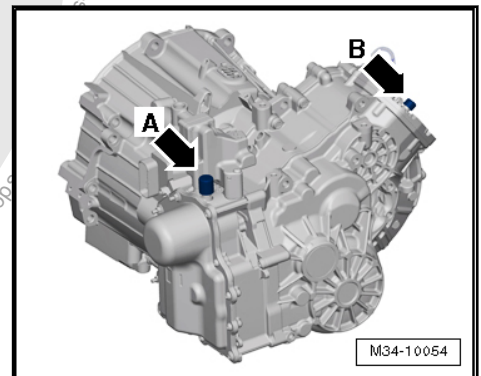


If the transmission was sealed so that no fluid can leak out, for example, after repairing or replacing the transmission:

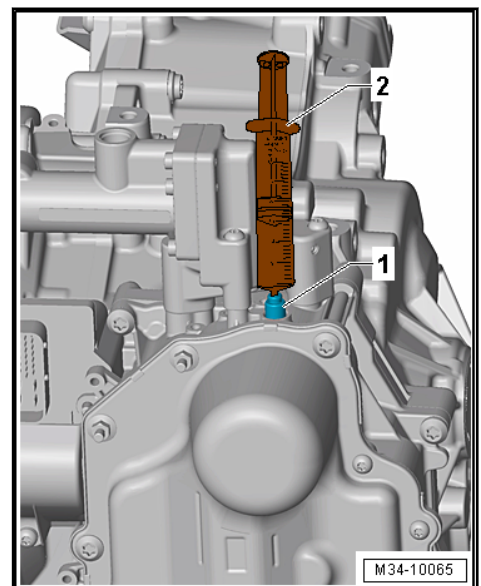
- Remove the plug from the transmission ventilation and install the ventilation cap -arrow B-.

Fill the transmission fluid via the transmission ventilation if the fluid was drained earlier. Refer to ➤ [“9.1 Transmission Fluid, Draining and Filling”](#), page 153.

- Remove the plug -arrow A- from the DSG Transmission Mechatronic -J743- ventilation.



- If more than approximately 20 ml of hydraulic fluid has leaked out, for example while removing and installing the DSG Transmission Mechatronic - J743- or while removing and installing the Electro-Drive Drive Motor - V141- , then add 30 ml of hydraulic fluid via the ventilation -1-.
- For the disposable syringe -2- from the Repair Kit - 5C0 998 152- and the correct hydraulic fluid. Refer to the Parts Catalog.
- Fill the new disposable syringe with 30 ml hydraulic fluid from the new Power Steering Fluid - G 004 000 M2- container.



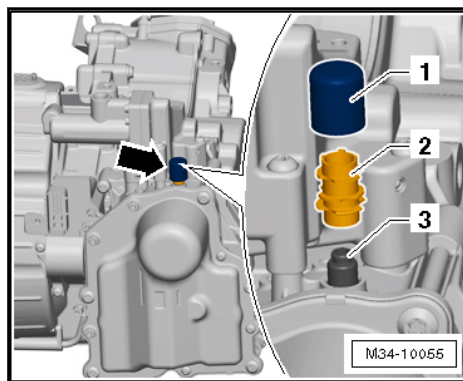
Caution

Risk of causing damage to the Mechatronic.

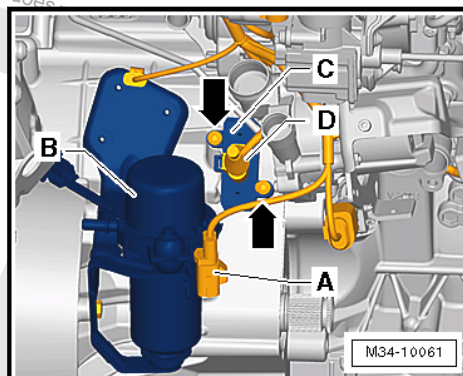
- ◆ ***Always use a new container to comply with cleanliness requirements.***
- ◆ ***Note the hydraulic fluid expiration date.***
- ◆ ***Always use a new disposable syringe from the Repair Kit - 5C0 998 152- . The disposable syringe must not be reused.***



- Push the new cap -1- on the ventilation -3-. It is replacement part with a vent -2-.



- Attach Drive Motor Rotor Position Sensor 1 - G713- -C- to the transmission -arrows-. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; Electro-Drive Drive Motor; Drive Motor Rotor Position Sensor 1 - G713- , Removing and Installing .
- Attach the bracket and Brake System Vacuum Pump - V192- -B- to the transmission. Refer to ⇒ Brake System; Rep. Gr. 47 ; Vacuum System; Overview - Electric Vacuum Pump .
- Attach the Drive Motor High Voltage Wiring Harness - PX2- to the transmission. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage Cables; Drive Motor High Voltage Wiring Harness, Removing and Installing .



The Transmission and Engine Will Be Installed Later in Another Procedure. Refer to ⇒ Rep. Gr. 10 ; Engine, Removing and Installing; Engine, Removing .

- Bleed the hydraulic clutch mechanism for the decoupler using the Vehicle Diagnostic Tester in Guided Functions under "Engine Control Module" after energizing the high voltage system.



Note

- ◆ *The decoupler in Electro-Drive Drive Motor - V141- separates the internal combustion engine from the Electro-Drive Drive Motor - V141- .*
- ◆ *Before the bleeding procedure, make sure that the battery is charged or is attached to a charging device during the procedure.*
- ◆ *After the bleeding procedure, delete the faults in stored in the transmission control module. Refer to Vehicle Diagnostic Tester .*

Tightening Specifications

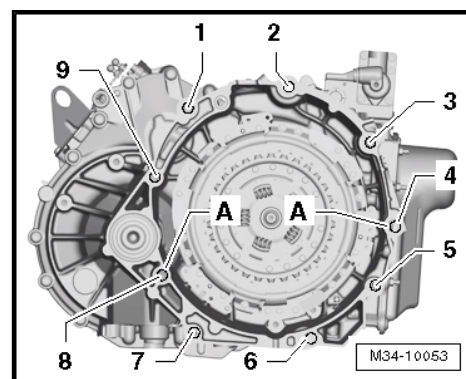
- ◆ For the hydraulic line bolt to the engine. Refer to ⇒ ["1.1 Overview - Mechatronic", page 53](#) .



3.3 Transmission Tightening Specifications

DSG® Transmission to Engine

Item	Bolt	Nm
1, 2	M12 x 50	80
3, 4	M12 x 105	80
5, 6, 7	M10 x 50	40
8, 9 ¹⁾	M12 x 70	80
A	Alignment sleeves for centering	
• ¹⁾ Attached from the engine side.		





4 Subframe Mount

⇒ ["4.1 Overview - Subframe Mount", page 112](#)

⇒ ["4.2 Transmission Bracket, Removing and Installing", page 114](#)

4.1 Overview - Subframe Mount



1 - Bolt

- ❑ For the tightening specifications. Refer to
⇒ Rep. Gr. 10 ; Sub-
frame Mount; Overview
- Subframe Mount .

2 - Bolt

- ❑ For the tightening spec-
ifications. Refer to
⇒ Rep. Gr. 10 ; Sub-
frame Mount; Overview
- Subframe Mount .

3 - Bolt

- ❑ For the tightening spec-
ifications. Refer to
⇒ Rep. Gr. 10 ; Sub-
frame Mount; Overview
- Subframe Mount .

4 - Pendulum Support

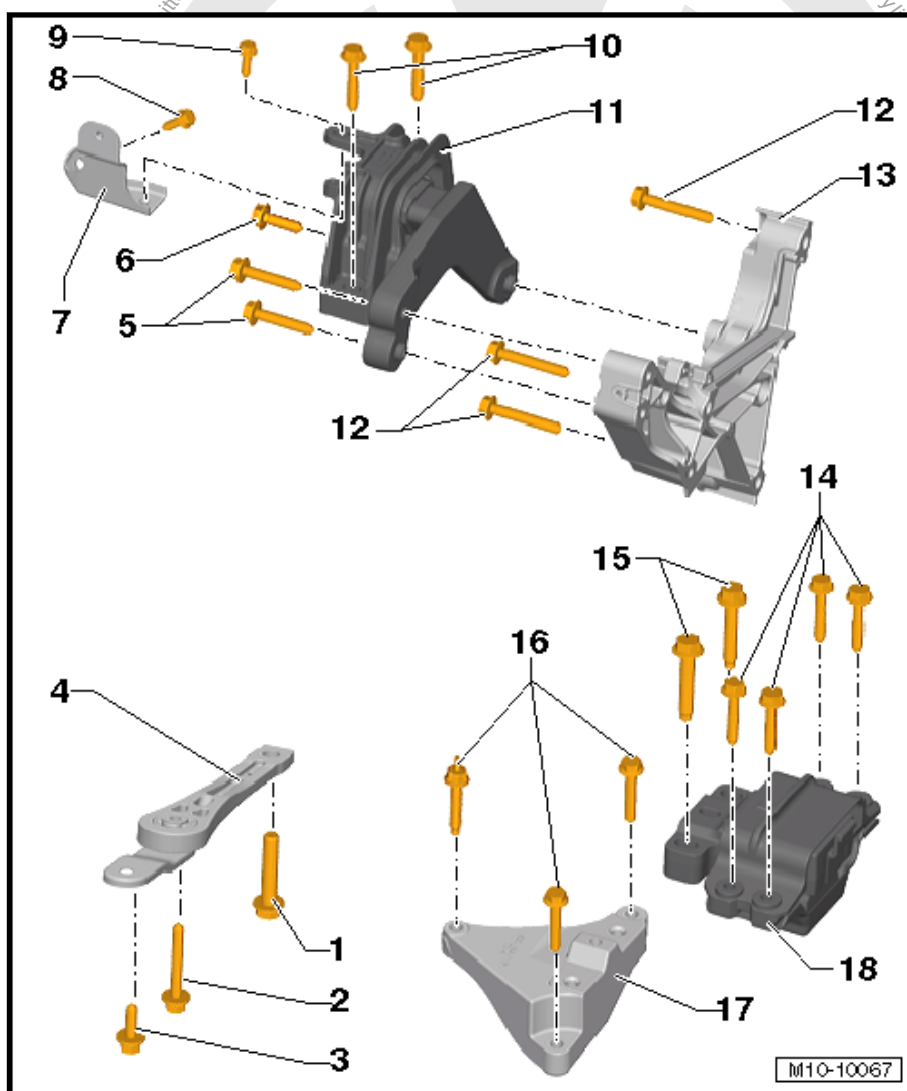
- ❑ For removing and
installing. Refer to
⇒ Rep. Gr. 10 ; Sub-
frame Mount; Overview
- Subframe Mount .

5 - Bolt

- ❑ For the tightening spec-
ifications. Refer to
⇒ Rep. Gr. 10 ; Sub-
frame Mount; Overview
- Subframe Mount .

6 - Bolt

- ❑ For the tightening spec-
ifications. Refer to
⇒ Rep. Gr. 10 ; Sub-
frame Mount; Overview
- Subframe Mount .



7 - Bracket

8 - Bolt

- ❑ For the tightening specifications. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

9 - Bolt

- ❑ For the tightening specifications. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

10 - Bolt

- ❑ For the tightening specifications. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

11 - Engine Mount

- ❑ With support arm
- ❑ For removing and installing. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

12 - Bolt

- ❑ For the tightening specifications. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

13 - Engine Support

- ❑ For removing and installing. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .



14 - Bolt

- ☐ For the tightening specifications. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

15 - Bolt

- ☐ 60 Nm +90° turn
- ☐ Replace after removing

16 - Bolt

- ☐ 40 Nm +90° turn
- ☐ Replace after removing

17 - Transmission Bracket

- ☐ Removing and installing. Refer to ⇒ ["4.2 Transmission Bracket, Removing and Installing", page 114](#) .

18 - Transmission Mount

- ☐ With support arm
- ☐ For removing and installing. Refer to ⇒ Rep. Gr. 10 ; Subframe Mount; Overview - Subframe Mount .

4.2 Transmission Bracket, Removing and Installing

Special tools and workshop equipment required

- ◆ Engine Support Bridge - 10-222A-
- ◆ Engine Support Bridge - Spindle - 10-222A/11- quantity: 2
- ◆ Engine Support Bridge - Engine Support 28 - 10-222A/28- quantity 2
- ◆ Engine Support Bridge - Engine Support 28-2 - 10-222A/28-2- quantity: 2
- ◆ Engine Support Bridge - Engine Support 31 - 10-222A/31-
- ◆ Engine Support - Basic Set - Rail with Holes - T40091/2- from the Engine Support - Basic Set - T40091-
- ◆ Engine Support - Supplement Kit Mount 5 - T40093/5- from the Engine Support - Supplement Kit - T40093A-
- ◆ Square Pipe - T40091/1- (quantity 2) from the Engine Support - Basic Set - T40091-
- ◆ Movable Joint - T40091/3- (quantity 2) from the Engine Support - Basic Set - T40091-
- ◆ Movable Joint - T40093/4- (quantity 2) from the Engine Support - Supplement Kit - T40091-

The transmission is installed.

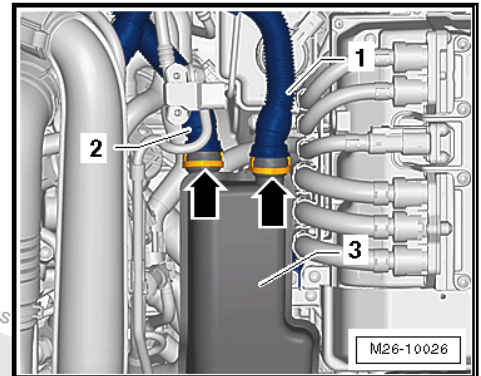
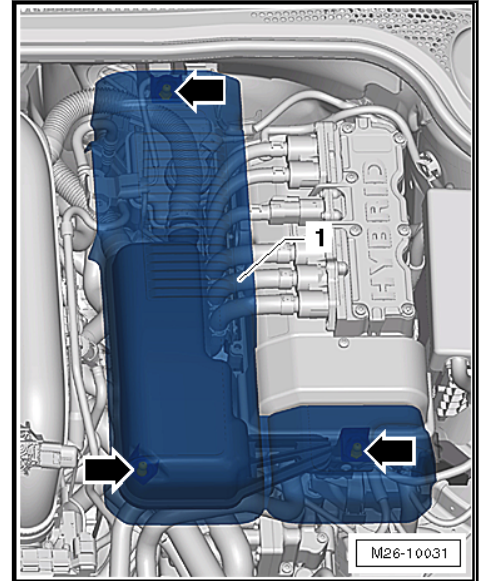


Removing

- Unclip and remove the damper cover -1- upward from the retainers -arrows-.

Vehicles with Secondary Air Injection (AIR) System

- Squeeze the locking ring -arrows- on both sides and remove the air lines -1 and 2- from the damper -3-.





- Remove the damper -1- upward from the rubber bushings -arrows-.

For All Vehicles



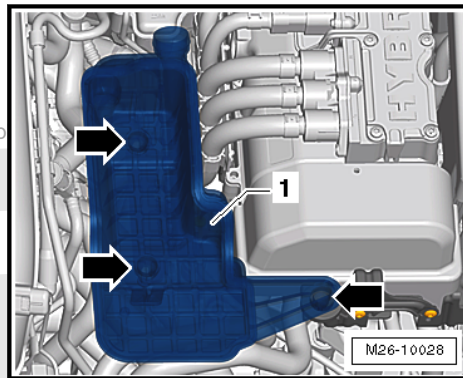
WARNING

Beware of the danger of electrocution.

An electrical shock can result in death.

Follow the High Voltage System General Warnings. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System General Warnings .

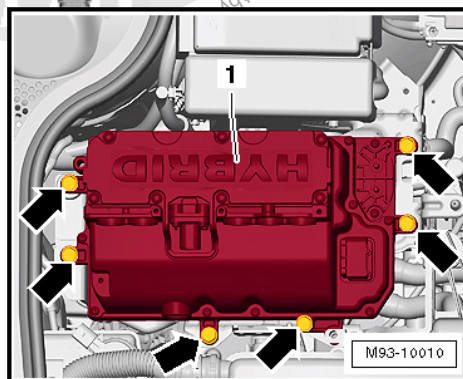
- ◆ ***A high voltage technician must de-energize the high voltage system before any work can be performed on the high voltage system or before any servicing work can be performed on the body.***
- ◆ ***Only hybrid electrically instructed persons may perform all work on a vehicle with a high voltage system. All work must be performed by a high voltage technician.***



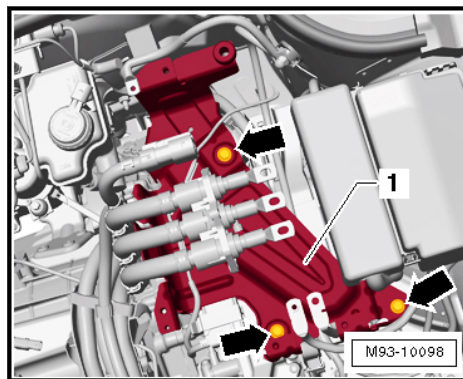
WARNING

High voltage at the high voltage system of the hybrid vehicle. Danger of electrocution! The following procedure requires work on the high voltage system. To de-energize the high voltage system. Refer to ⇒ Hybrid Electrical System; Rep. Gr. 93 ; High Voltage System, De-energizing .

- Remove the Electric Drive Power and Control Electronics - JX1- . Refer to ⇒ Electrical Equipment; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .

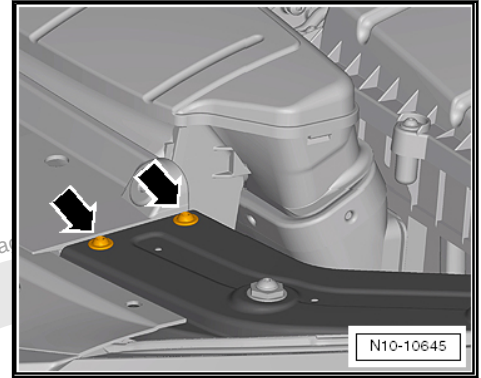


- Remove the bracket -1- for the Electric Drive Power And Control Electronics - JX1- arrows. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage Cables; High Voltage Battery High Voltage Cable Set, Removing and Installing .

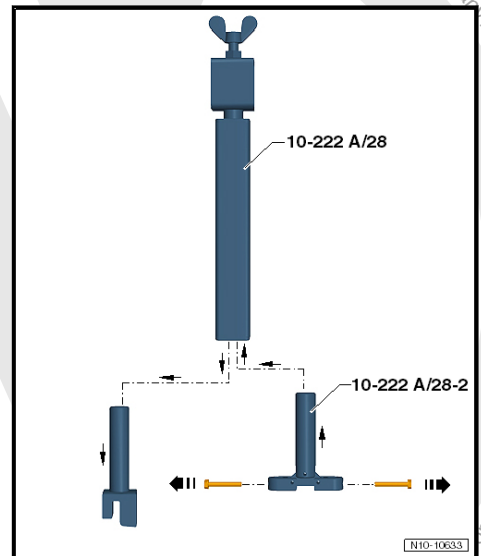




- Remove the bolts -arrows- from the left and right sides of the lock carrier bracket.



- Remove the lower mounts on the Engine Support Bridge - Engine Support 28 - 10-222A/28- and replace with the Engine Support Bridge - Engine Support 28-2 - 10-222A/28-2 .
- Remove the bolts -arrows- for securing the engine support bridge on the lock carrier from the Engine Support 28-2 - 10-222A/28-2 .
- Use the bolts from the Engine Support Bridge - Engine Support 28-2 - 10-222A/28-2- for attaching the Engine Support Bridge - Engine Support 28 - 10-222A/28- Do not use the bolts for the bracket.

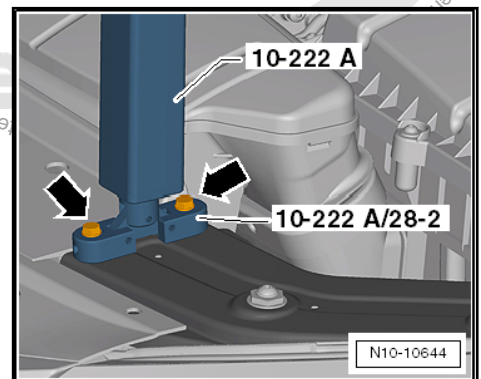


- Install the Engine Support Bridge - Engine Support 28 - 10-222A/28- and tighten the bolts -arrows-.
- Bolt tightening specification -arrows- 8 Nm.



Caution

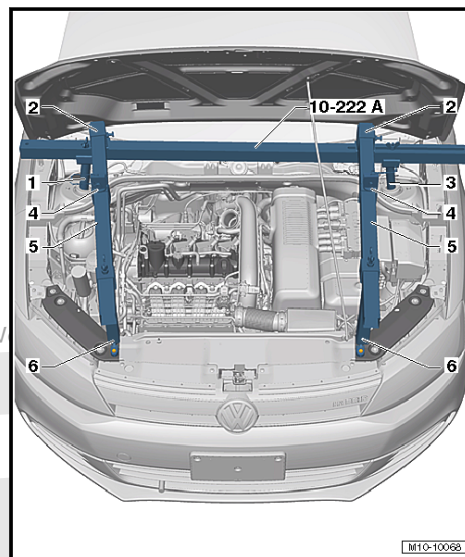
A second technician is needed to mount the Engine Support Bridge on the vehicle to prevent the Engine Support Bridge from tipping.





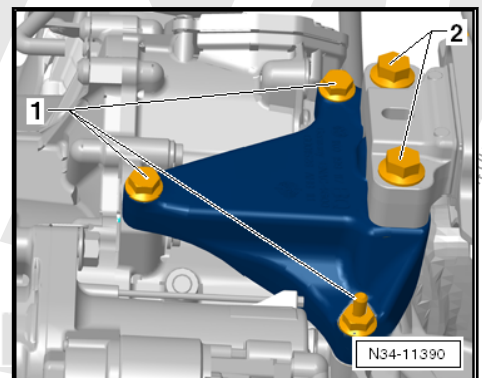
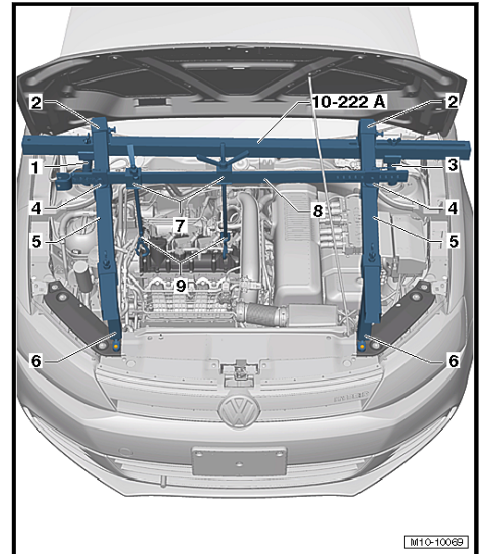
Mount the engine support bridge on the engine/transmission sub-assembly as follows:

- 1 - Engine Support Bridge - Engine Support 31 - Adapter 2 - 10-222A/31-2-
 - 2 - Engine Support - Basic Set - Moveable Joint - T40091/3-
 - 3 - Engine Support Bridge - Engine Support 31 - Adapter 1 - 10-222A/31-1-
 - 4 - Movable Joint - T40093/4-
 - 5 - Engine Support - Basic Set Square Pipe - T40091/1-
 - 6 - Engine Support Bridge - Engine Support 28 - 10-222A/28- with Engine Support Bridge - Engine Support 28-2 - 10-222A/28-2-
- First slide the Moveable Joints -2- onto the Square Pipe from the Engine Support Bridge - 10-222A-
 - The bolts for the Movable Joints - T40091/3- -2- on the Engine Support Bridge - 10-222 A- face the direction of travel.
 - Mount the Engine Support Bridge - 10-222A- on the suspension strut towers and have a second technician hold it to prevent it from tipping.
 - Push the Engine Support - Basic Set - Square Pipe - T40091/1- - 5- from the front left and right through the Engine Support Bridge - Engine Support 28 - 10-222A/28- - 6- and place on each side of the Engine Support - Supplement Kit - Movable Joint - T40093/4- - 4-.





- Slide the Engine Support - Basic Set - Rail with Holes - T40091/2- - 8- with the Engine Support - Supplement Kit Mount - T40093/5- -7- in the Engine Support - Supplement Kit - Moveable Joint - T40093/4- - 4-.
- 1 - Engine Support Bridge - Engine Support 31 - Adapter 2 - 10-222A/31-2-
- 2 - Engine Support - Basic Set - Moveable Joint - T40091/3-
- 3 - Engine Support Bridge - Engine Support 31 - Adapter 1 - 10-222A/31-1-
- 4 - Movable Joint - T40093/4-
- 5 - Engine Support - Basic Set Square Pipe - T40091/1-
- 6 - Engine Support Bridge - Engine Support 28 - 10-222A/28- with Engine Support Bridge - Engine Support 28-2 - 10-222A/28-2-
- 7 - Mount - T40093/5-
- 8 - Rail with Holes - T40091/2-
- 9 - Engine Support Bridge - Spindle - 10-222A/11-
- Install the locking pins into the Engine Support - Basic Set - Rail with Holes - T40091/2- -8- and secure it splints.
- Tighten all threaded connections on the Engine Support Bridge hand-tight. Adjust the height of the Engine Support Bridge parallel over the Engine Support Bridge - Engine Support 28 - 10-222A/28- .
- Lightly tension the engine/transmission assembly using the Engine Support Bridge - Spindle - 10-222A/11- -item 9- do not lift.
- Remove the Ground (GND) wire from the double bolt refer to [page 120](#) attaching the transmission bracket to the transmission.
- Loosen the bolts -1- on the transmission bracket approximately 1 turn and remove the bolts -2-.
- Slightly lower the engine with the transmission using the Engine Support Bridge - 10-222A- spindle.
- 4 turns are enough to remove the transmission bracket.
- Do not lower any further, otherwise it will be necessary to remove the pendulum support.





- Remove the bolts -arrows A and B-. Remove the transmission bracket -1-.



Note

There is a Ground (GND) wire attached to the double bolt -arrow B-

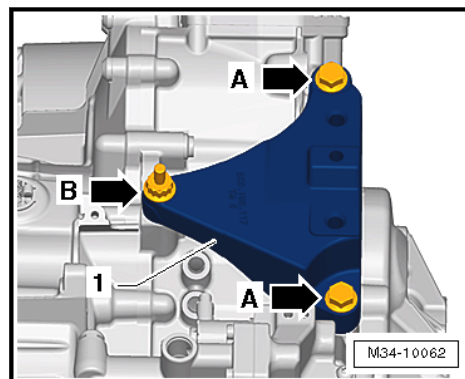
Installing

Install in reverse order of removal. Note the following:



Note

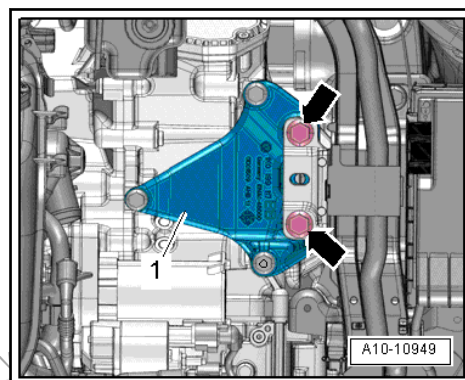
Bolt that were tightened with an additional turn must be re-placed.



Caution

Risk of damaging threads in transmission bracket by inserting bolts crooked.

- ◆ **The transmission bracket -1- and the transmission mount support arm must be absolutely parallel to each other before installing the bolts -arrows-. If necessary, lift the back of the transmission with a floor jack or a transmission jack.**
- ◆ **Only remove the Engine Support Bridge - 10-222A- when bolts for subframe mount are tightened to tightening specification.**



- Lift the transmission using the spindle on the Engine Support Bridge until the transmission bracket touches the support arm on the transmission mount.
- Check the subframe mount adjustment. Refer to ➔ Rep. Gr. 10 ; Subframe Mount; Subframe Mount, Checking Adjustment .
- Remove the Engine Support Bridge - 10-222A- from the engine.

Install the Electric Drive Power and Control Electronics - JX1- . Refer to ➔ Electrical Equipment; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .

- Energize the high voltage system and complete the required documentation. Refer to ➔ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System, Energizing .

Tightening Specifications

- ◆ Refer to ➔ [“4.1 Overview - Subframe Mount”, page 112](#)



5 Transmission, Transporting

⇒ "5.1 Transmission, Transporting", page 121

5.1 Transmission, Transporting

Special tools and workshop equipment required

- ◆ Engine Support Bridge - Additional Hooks (2 pc.) - 10-222A/2-
- ◆ Engine/Gearbox Support Shackle (2 pc.) - 10-222A/12-
- ◆ Shop Crane - VAS6100-

Seal the Transmission So That No Fluid Can Leak Out

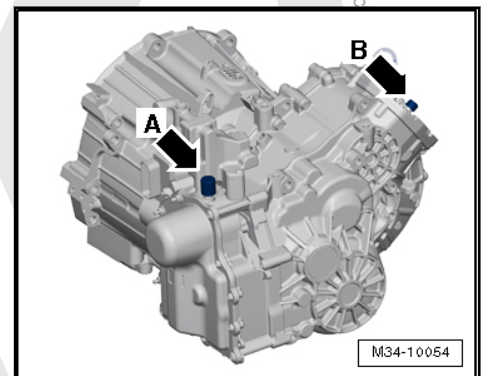


Caution

Danger of causing damage to the transmission.

The vent on the DSG Transmission Mechatronic - J743- (-arrow A-) and the transmission ventilation (-arrow B-) must be sealed tight so that no fluid can leak out.

- ◆ **Checking the hydraulic fluid level in the DSG Transmission Mechatronic - J743- is not possible. The vent on the DSG Transmission Mechatronic - J743- must be sealed tight before performing any assembly work.**
- ◆ **Hydraulic fluid that has leaked out of the DSG Transmission Mechatronic - J743- may not be refilled.**
- ◆ **Should hydraulic fluid leak out, it is possible to add new fluid using via the vent on the Mechatronic. For the correct hydraulic fluid, sealing plugs and disposable syringe from the Repair Kit - 5C0 998 152- . Refer to the Parts Catalog. Perform the filling as soon as possible after installing the transmission in the vehicle. Dispose of the remaining hydraulic fluid and sealing plugs with the disposable syringe.**
- ◆ **If transmission fluid has leaked out, then it is necessary to perform a transmission fluid replacement. It is not possible to check the fluid level.**
- ◆ **Under filling or overfilling both fluid systems will impair the function of the transmission.**



- Remove both caps -arrow A and B-.



Note

- ◆ **The vent cap -arrow A- on the Mechatronic will get damaged when being removed and must be replaced.**
- ◆ **As an alternative to the Engine Bung Set - VAS6122- the Protective Cap - 02M 409 120- can be used to seal the transmission. The Protective Cap - 0AM 325 120 A- can also be used to seal the Mechatronic securely. Refer to the Parts Catalog.**
- Seal off the transmission ventilation on the DSG Transmission Mechatronic - J743- with clean plugs so that no fluid can leak out.



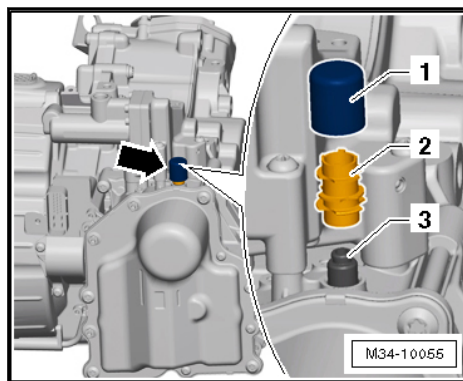
- Order a new cap -arrow- for the DSG Transmission Mechanic - J743- . It must be replaced after installing the transmission. Refer to the Parts Catalog.



Note

The replacement vent -2- and cap -1- are a single component and is pushed onto the ventilation -3-.

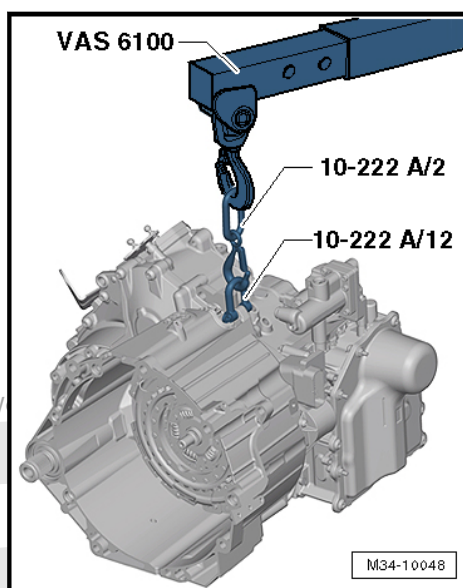
- Remove the plugs after installing the transmission into the vehicle and re-install or replace the vent caps.



Transmission, Transporting

Requirement:

- The transmission is sealed so that no fluid can leak out.
Refer to [⇒ page 121](#) .





6 Transmission, Disassembling and Assembling

⇒ [“6.1 Schematic Overview - Transmission”, page 123](#)

⇒ [“6.2 Transmission, Disassembling and Assembling”, page 124](#)

6.1 Schematic Overview - Transmission

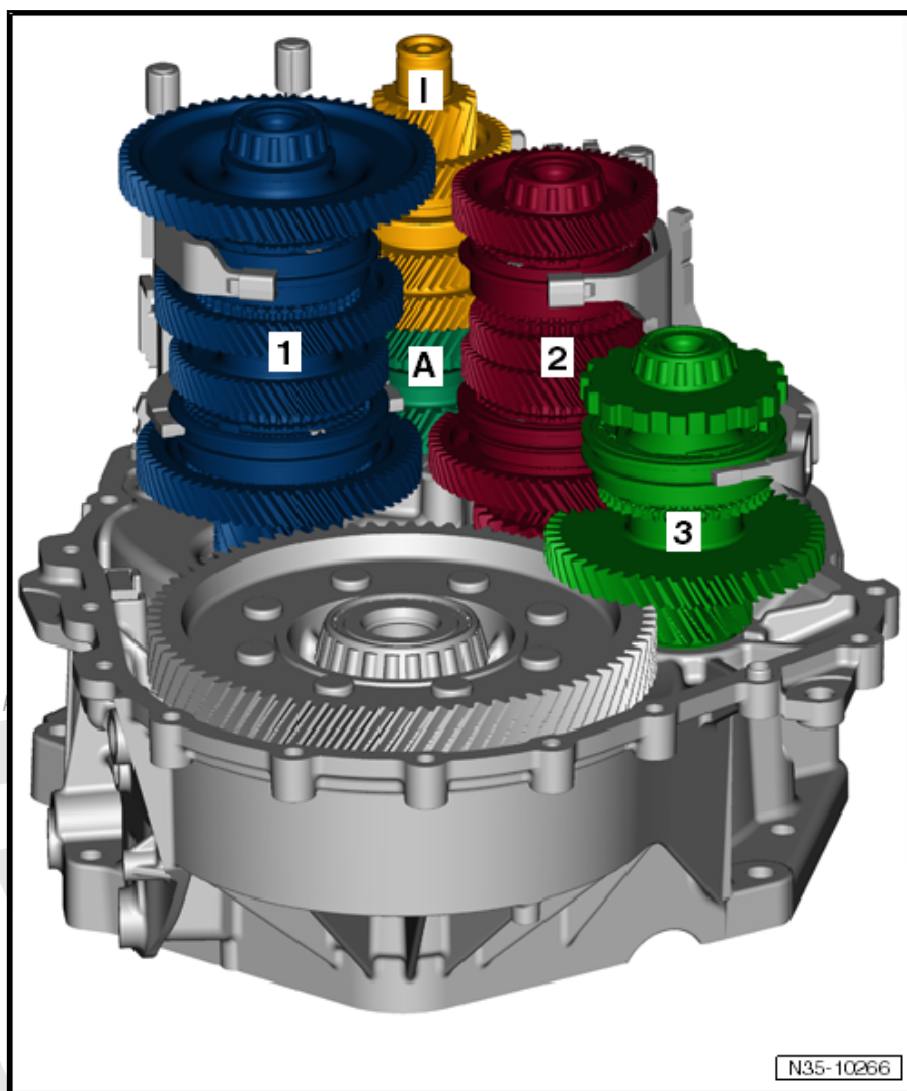
A - Exterior Driveshaft

I - Inner Driveshaft

1 - Output Shaft 1

2 - Output Shaft 2

3 - Output Shaft 3



Notes for Disassembling the Transmission

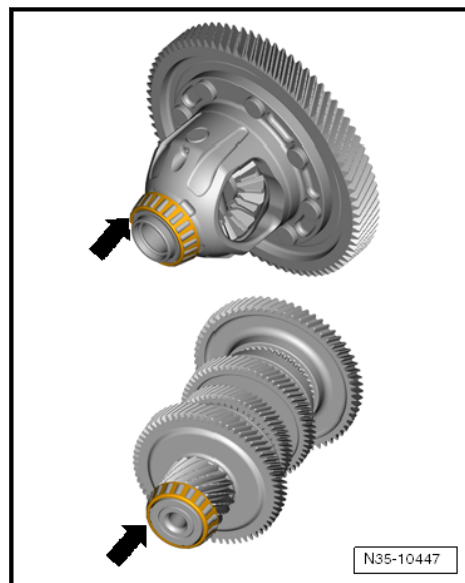
The transmission replacement parts are allocated according to the transmission code.



For each assembly on the shafts pay attention to the »lower« bearing. The bearing cage can be very easily bent or damaged by »rubbing«.

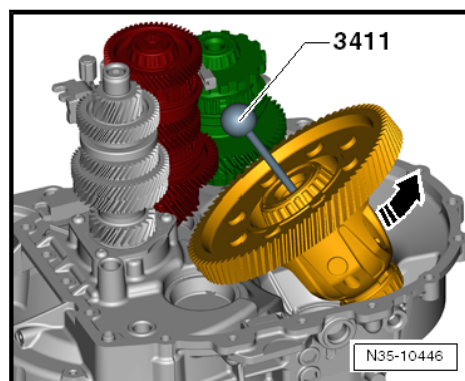
The bearing shells may not be interchanged. They are paired with the bearing.

Always replace the bearing from a shaft together.



Example:

Always install the differential using a Lock Carrier Support Tool - 3411-. Pay attention not to rub against the lower bearing.



6.2 Transmission, Disassembling and Assembling

⇒ ["6.2.1 Transmission, Disassembling", page 124](#)

⇒ ["6.2.2 Transmission, Assembling", page 131](#)

6.2.1 Transmission, Disassembling

Special tools and workshop equipment required

- ◆ Support Bridge - T10323-
- ◆ Assembly Tool - Component 5 - T10356A/5-
- ◆ Press Piece - Bushing VW434-
- ◆ Puller - Crankshaft/Power Steering Seal - T20143/2-
- ◆ Clutch Press Piece - T10376-
- ◆ Press Tool - T10427-
- ◆ Lock Carrier Support Tool - 3411-
- ◆ Silicone Remover . Refer to the Parts Catalog.
- Secure the transmission on the engine and transmission holder. Refer to ⇒ ["8 Securing on Engine and Transmission Holder", page 152](#) .

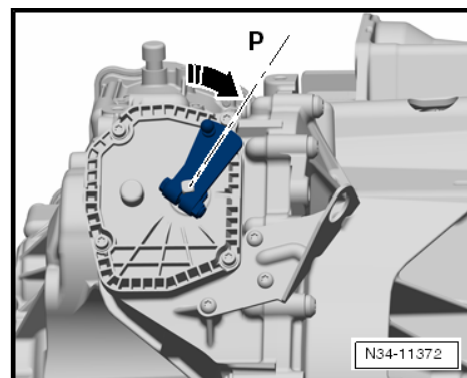
Requirements

- Clutch is removed.

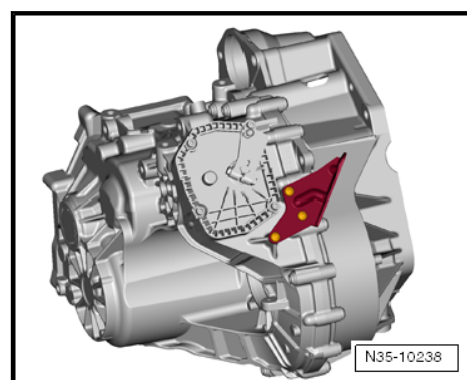




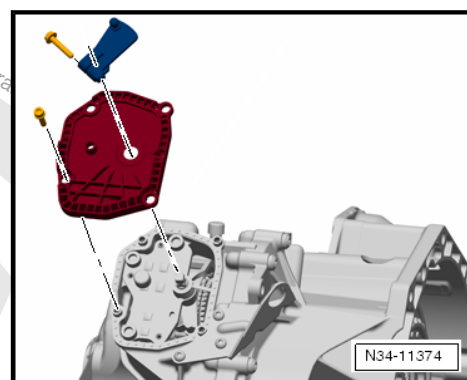
- Mechatronic is removed.
- Transmission fluid is drained.
- Insert the park lock.



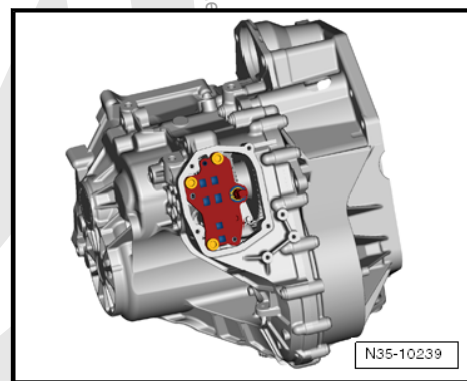
- Remove the cable bracket.



- Remove the lever and cover.

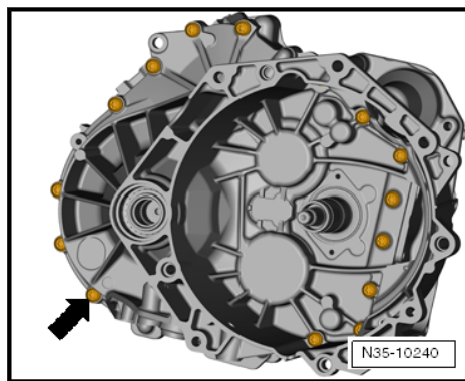


- Remove the parking lock. Refer to ➤ [“3.2 Parking Lock, Removing and Installing”, page 235](#).
- Remove the dual clutch. Refer to ➤ [“2.2 DSG® Clutch, Removing”, page 37](#).
- Remove the clutch engaging mechanism. Refer to ➤ [“1.2 Clutch Engaging Mechanism, Removing and Installing”, page 19](#).
- Remove the Mechatronic. Refer to ➤ [“1.2 Mechatronic, Removing and Installing”, page 56](#).
- Remove the flange shafts ➤ [“1.1 Overview - Component Location Seals”, page 242](#).



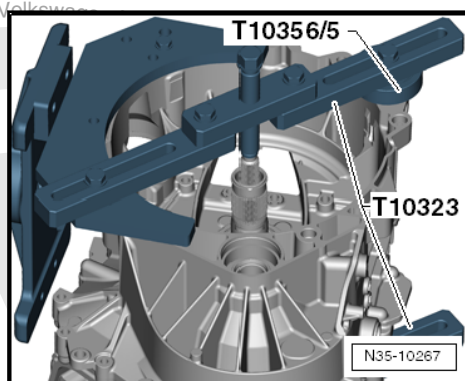


- Remove the connecting bolts from the clutch housing halves.

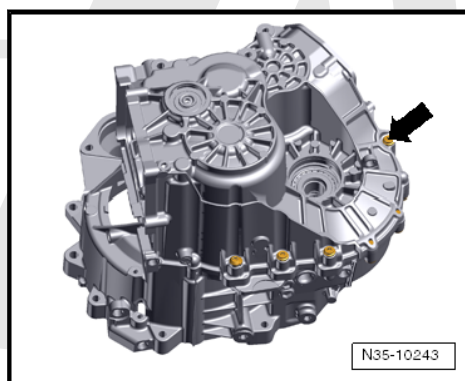


- Install the Support Bridge - T10323- and turn the spindle hand-tight against the inner driveshaft.

This secures the shaft. The transmission housing is removed later. The force is therefore not transferred uncontrolled into the transmission.

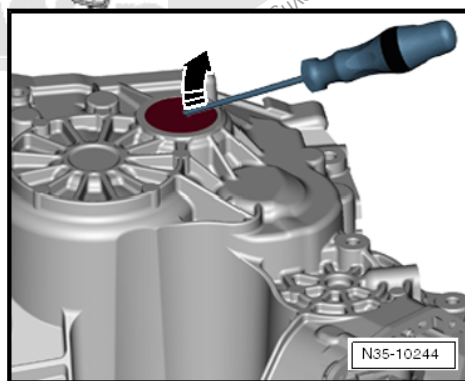


- Turn the transmission and remove the remaining connecting bolts from the transmission halves.



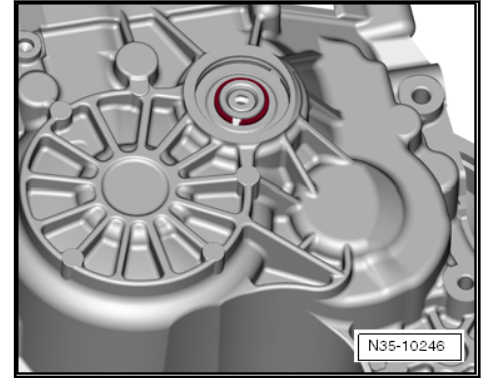
- Pierce through the "inner driveshaft cover" and pry out.

Then drive in the screwdriver in the »center« and at a strong »angle« in the cover. Only far enough that the cover can be pried off.





- Remove the circlip.
- Pry out the Mechatronic alignment sleeves.



- Install an additional puller from above.

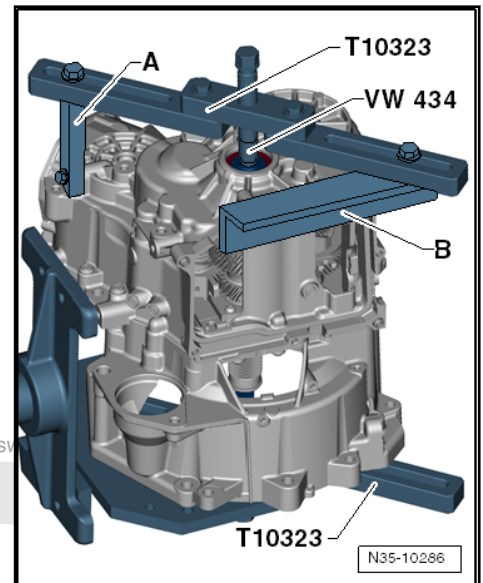
Attach the Square Pins - T10427/1- -A- and Angle - T10427- -B- hand-tight.

The Spindle Presses on the Driveshaft.

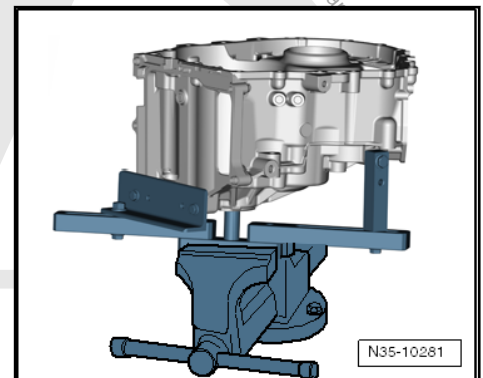
- While removing the removal force can be supported with »targeted« hammer tapping.
- At the same time use a hardwood base.

This way the adhesive between both housing halves loosens easier.

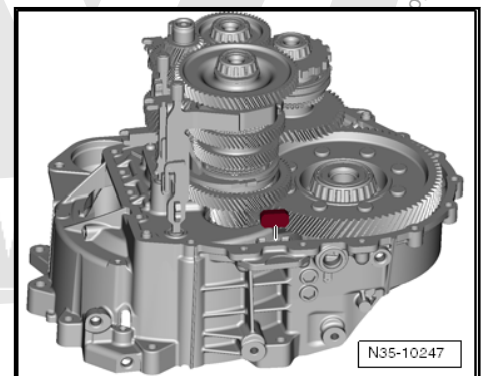
- Remove the transmission housing and move to the side.



For the assembly, the transmission housing can be tensioned in the vise using the puller for the assembly.

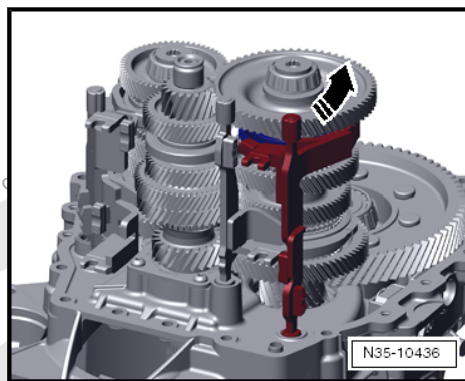


- Remove the magnet and clean.

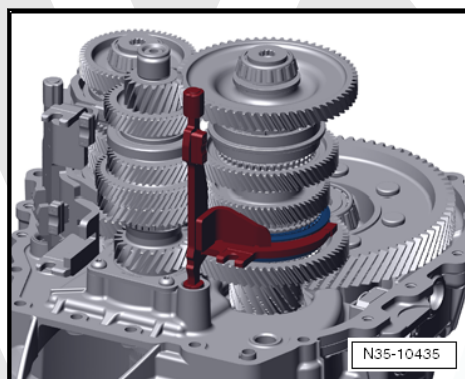




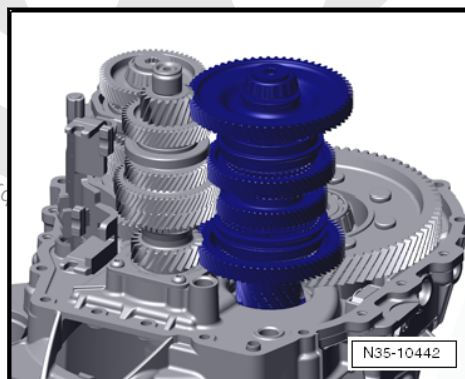
- Switch the shift fork for the 1st gear and 3rd gear upward in the 1st gear.
- Lightly lift output shaft 1, slightly tip -arrow- and remove the shift fork.



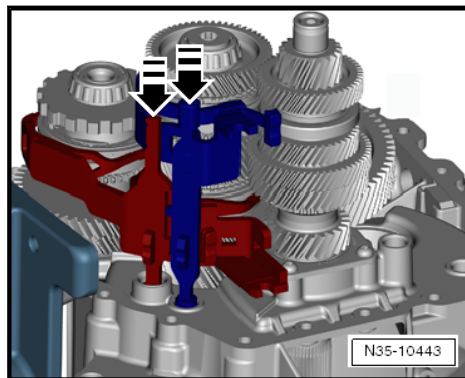
- Switch the shift fork for the 2nd gear and 4th gear upward in the 4th gear.
- Here also lift the output shaft 1, tip slightly and remove the shift fork.



- Remove the output shaft 1.

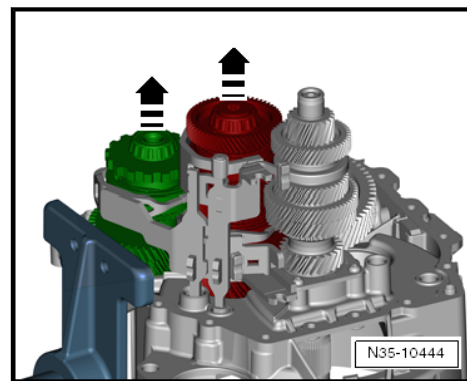


- Shift down the remaining shift forks.

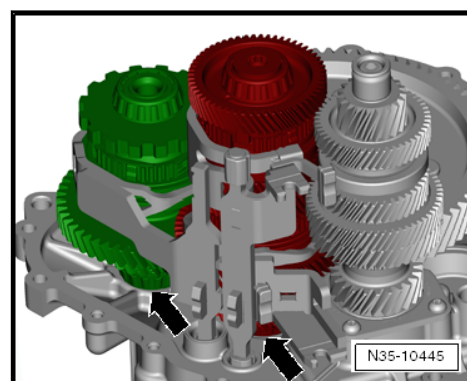




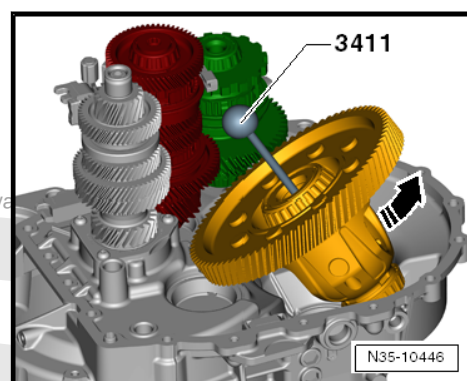
- Lift the output shaft 2 and 3 from the lower bearings.



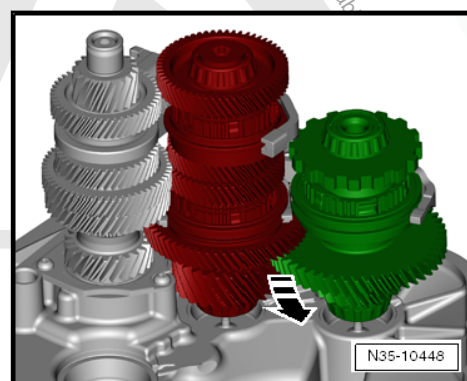
- Remove both shafts »in the direction of« the shift forks from the clutch housing.



- Install the Lock Carrier Support Tool - 3411- in the differential.
- Remove the differential. The output shaft 2 can be slightly raised for this.

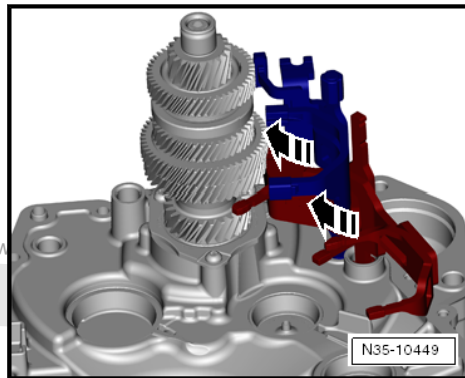


- Remove the output shaft 2 and 3.

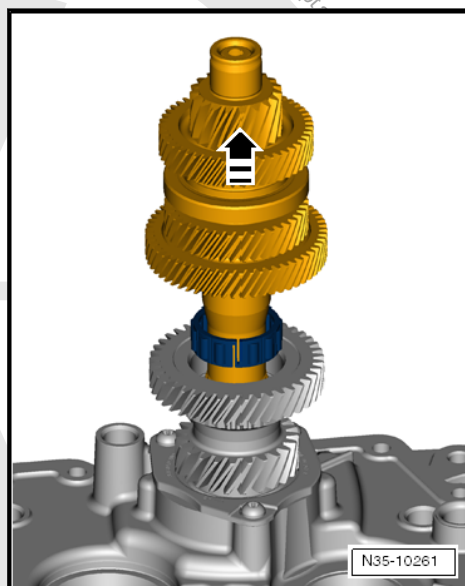




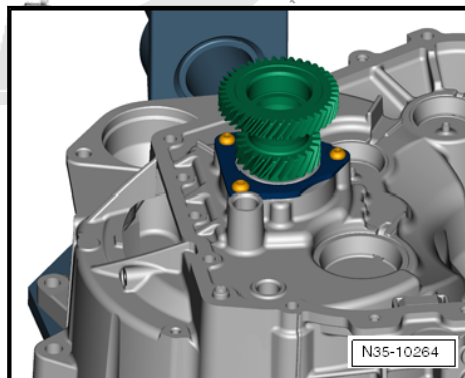
- Turn the shift fork »inward«.
- Remove the shift fork.



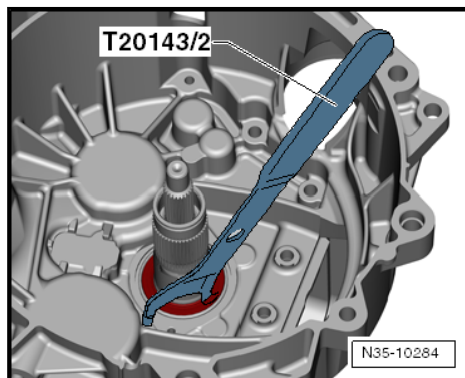
- Remove the inner driveshaft.
- A roller bearing is located between the inner and outer driveshaft. Also remove this.
 - This bearing may not be broken.



- Remove the three bolts.
- Rotate the clutch housing together with the »last« outer driveshaft.

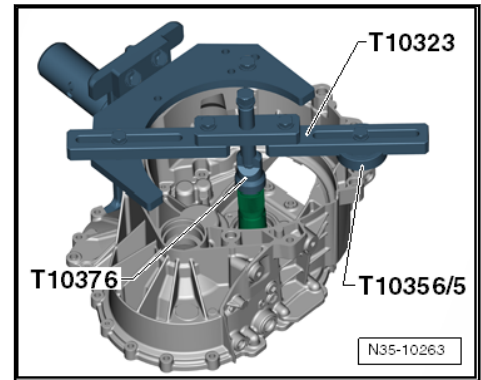


- Pry out the outer seal.





- The outer driveshaft can now be pressed out.
- Secure the shaft with a hand. So that it cannot fall.



Note

The »pressed out shaft« will fall downward.

- The bearing on the outer driveshaft must always be replaced. Refer to ⇒ [“1.1.1 Outer Driveshaft, Disassembling and Assembling”, page 168](#) . The circlip -arrow- must also be newly adapted.

By pressing out the shaft the force is transferred over the bearing ball hub.

- Clean the surface of both housings using Silicone Remover .

The transmission disassembly is complete.

Additional Procedures:

Assembling the transmission. Refer to ⇒ [“6.2.2 Transmission, Assembling”, page 131](#) .

Transmission Housing, Disassembling and Assembling. Refer to ⇒ [“7.3 Transmission Housing, Servicing”, page 146](#) .

Clutch Housing, Disassembling and Assembling. Refer to ⇒ [“7.4 Clutch Housing, Servicing”, page 148](#) .

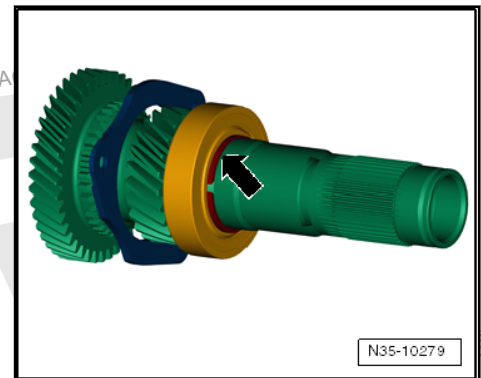
Outer Driveshaft, Disassembling and Assembling. Refer to ⇒ [“1.1.1 Outer Driveshaft, Disassembling and Assembling”, page 168](#) .

Inner Driveshaft, Disassembling and Assembling. Refer to ⇒ [“1.1.2 Inner Driveshaft, Disassembling and Assembling”, page 170](#) .

Output Shaft 1, Disassembling and Assembling. Refer to ⇒ [“2.2 Output Shaft 1, Disassembling and Assembling”, page 179](#) .

Output Shaft 2, Disassembling and Assembling. Refer to ⇒ [“2.3 Output Shaft 2, Disassembling and Assembling”, page 188](#) .

Output Shaft 3, Disassembling and Assembling. Refer to ⇒ [“2.4 Output Shaft 3, Disassembling and Assembling”, page 195](#) .



6.2.2 Transmission, Assembling

Special tools and workshop equipment required

- ◆ Support Bridge - T10323-
- ◆ Assembly Tool - Component 5 - T10356A/5-
- ◆ Press Piece - 60mm - VW415A-



- ◆ Press Piece - 37mm - VW416B-
- ◆ Hot Air Blower - VAG1416-
- ◆ Cartridge Gun - VAG1628-
- ◆ Lock Carrier Support Tool - 3411-
- ◆ Socket - T10310-
- ◆ Assembly Adhesive . Refer to the Parts Catalog.

Clean the Sealing Surfaces of Both Transmission Halves.

- First install the outer driveshaft.
- The outer driveshaft must already be prepared for this. One new bearing with the correct circlip must already be installed. Refer to ["1.1.1 Outer Driveshaft, Disassembling and Assembling", page 168](#).
- Warm up the clutch housing in the area of the outer driveshaft to approximately 100 °C (212 °F) using a hot air gun.
- When the housing is correctly warmed the outer driveshaft can be installed by hand all the way. This occurs without force.

If the bearing gets stuck, the clutch housing is »still too cold«.

Do not Press in Again.

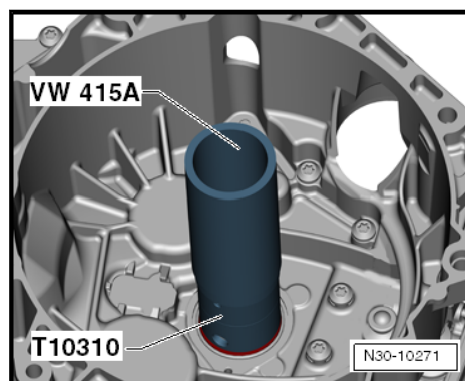
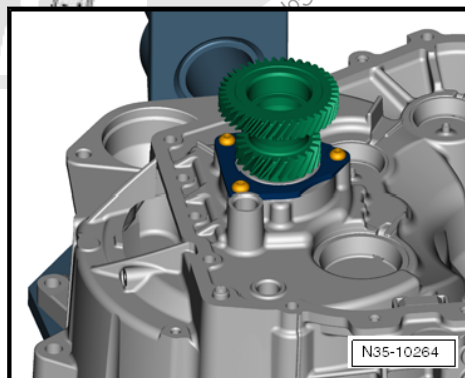
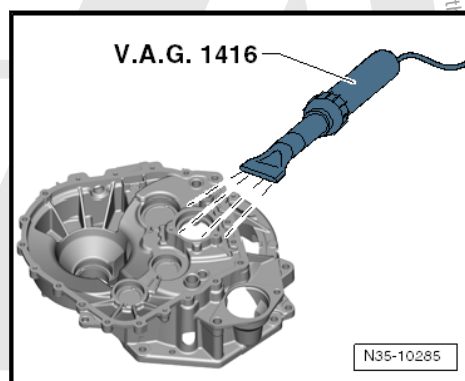
- Remove the shaft again and warm the clutch housing correctly.
- After cooling: tighten three bolts. Refer to ["1.1.1 Outer Driveshaft, Disassembling and Assembling", page 168](#).
- Rotate the clutch housing.

- Drive in the outer, »new« seal flush to the clutch housing using a plastic mallet.

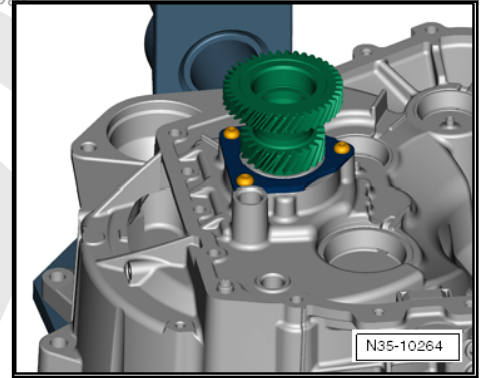


WARNING

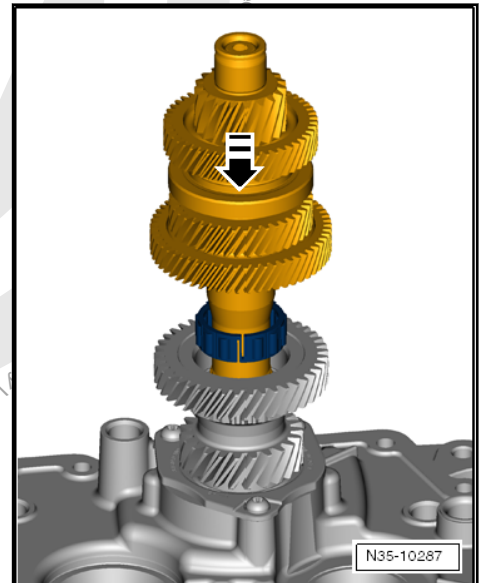
Install the seal flush so that the oil bore behind it is not sealed. Otherwise the bearing will not have enough oil.



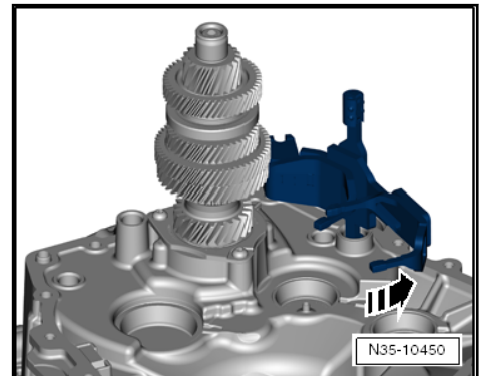
- Turn the clutch housing again.



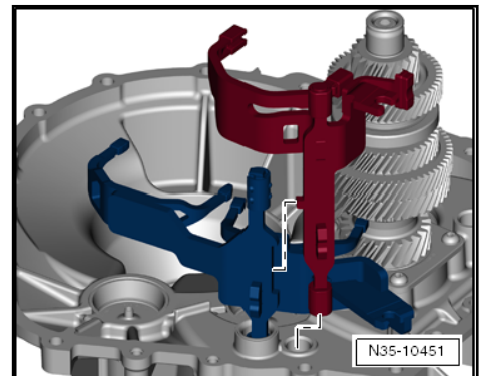
- Insert the inner driveshaft with roller bearing.
- The bearing may not be broken. Oil the bearing.
- Switch all locking collars from the output shaft 2 and 3 »downward«.



- Insert the 6th shift fork and reverse drive gear.
- The position of the fork can only be turned once the fork is »all the way down«.



- Insert the shift fork for the 5th and 7th gear.
- This shift fork can be easily installed when the other shift fork is lifted slightly.





For the Following Steps:

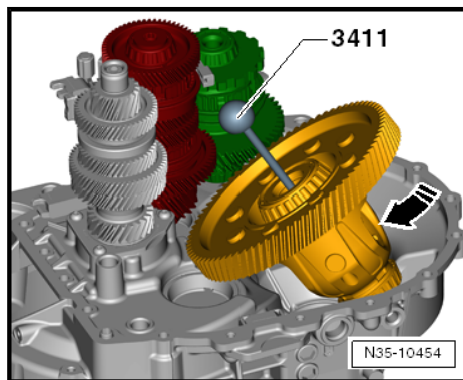
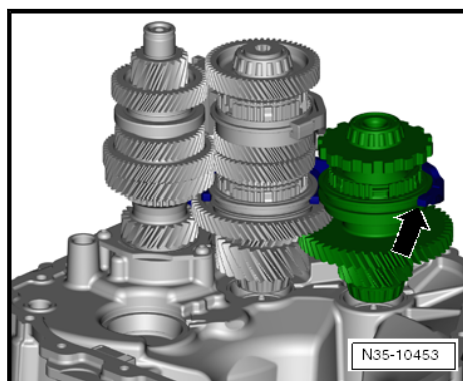
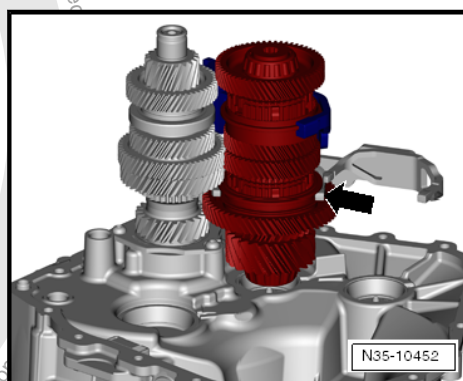
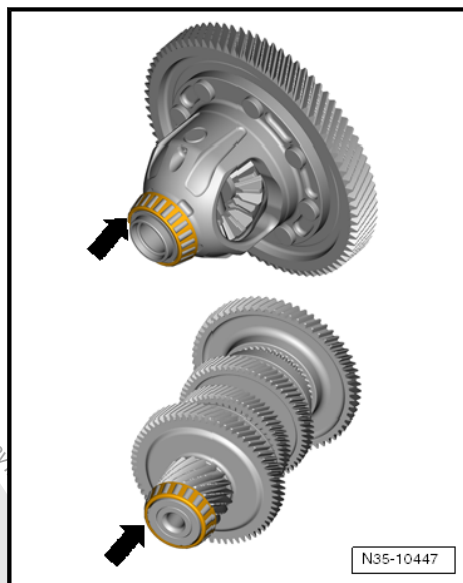
The tapered roller bearing can be damaged very quickly when inserted with force or bent by striking with force.

- Insert output shaft 2.
- Pay attention to both locking collars. The jaw »upper« and the jaw »lower« -arrow- must be inserted correctly.
- The output shaft 2 is placed on the clutch housing not on the bearing shell.

- Insert the output shaft 3.
- Pay attention to the shift fork jaw and the locking collar -arrow-.

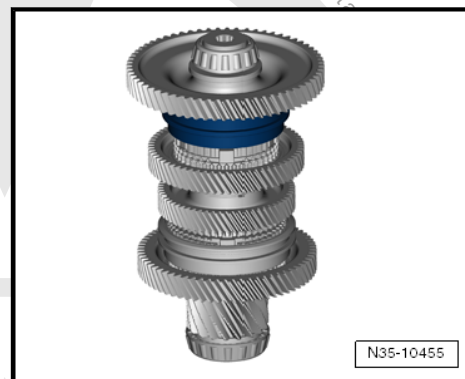
This shaft is also »placed« on the clutch housing.

- Install the differential.
- Pay attention that the bearing does not hit the clutch housing.
- Carefully place the output shaft in the bearing.
- Slightly pry out the inner driveshaft. This places the output shaft 2 in its installation position.
- Remove the Lock Carrier Support Tool - 3411- .





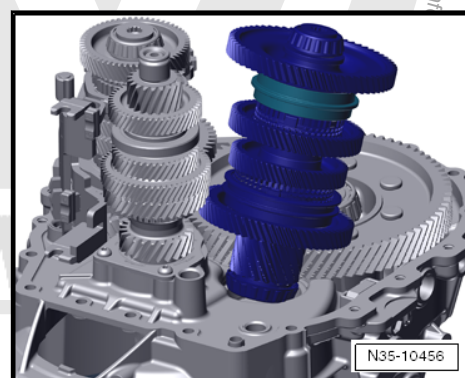
- For the output shaft 1 switch the »upper« locking collar upward.



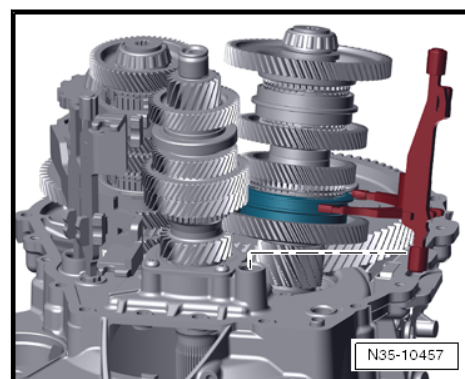
- Insert the output shaft 1 »at an angle from above«.

The shaft should remain at an angle.

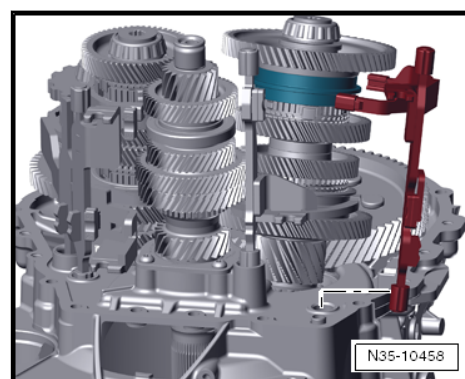
Then before the shaft is placed in its installation position, the shift forks must be mounted.



- Place the shift fork for the 2nd and 4th gear in the bushing then pivot their guide.

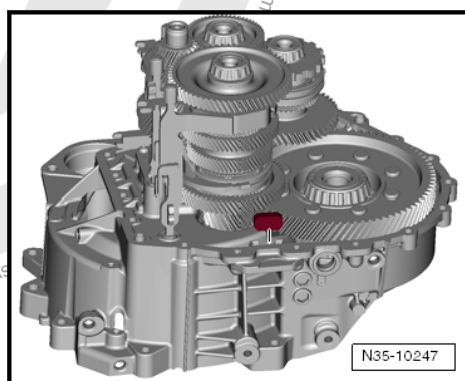
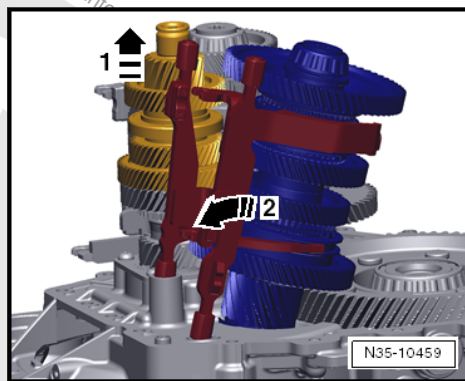


- Place the shift fork for the 1st to 3rd gear on the bushing then pivot to their guide.



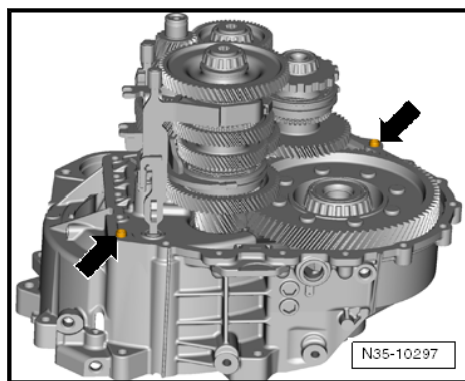


- Slightly lift the inner driveshaft. In this way the output shaft 1 can be brought into its installation position.
 - After inserting place all shift forks in neutral.
 - Check the shift forks and output shafts for the correct seating.
- 1 - Turn the Shafts.
 - 2 - Look at the Shift Forks.
 - 3 - Turn the Shaft Gears Slightly Back and Forth. Also on the Differential.
 - 4 - Grasp from Below on the Inner and Outer Driveshaft. Turn the Shafts Once.
- All parts must be able to be turned back and forth without catching.
 - Insert the magnet.

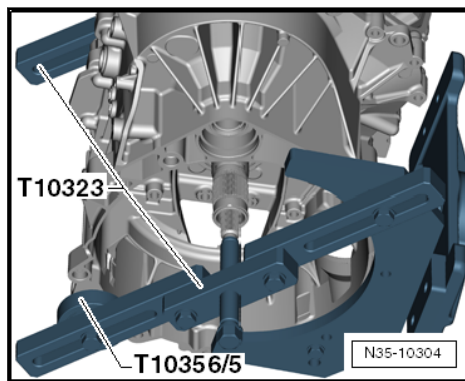


- Insert the alignment sleeves.

Leave the Transmission in this Position



- Install the Support Bridge - T10323- from below.
- Turn the spindle hand-tight against the inner driveshaft.





The shaft is only supported. It may only be removed so far, until the gear wheel for the 7th gear contacts the inner driveshaft -A- of the gear wheel for the 3rd gear of the driveshaft 1 -B-.

It is sufficient when the spindle contacts the shaft.

This prevents force from transferring in the transmission later when positioning the transmission housing. The force is absorbed by the -T10323-.

- Drip some oil on all the exposed tapered roller bearings.
- Prepare the transmission housing for installing.
 - The transmission housing is completely assembled.
 - The flange surface is cleaned.
 - The oil guide is installed.
- Using the Assembly Adhesive place an adhesive bead on the clutch housing flange.
 - »Adhesive bead thickness«: maximum 1 millimeter.

The adhesive is applied using the -VAG1628-.

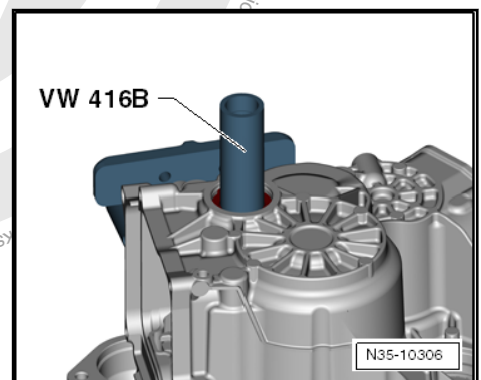
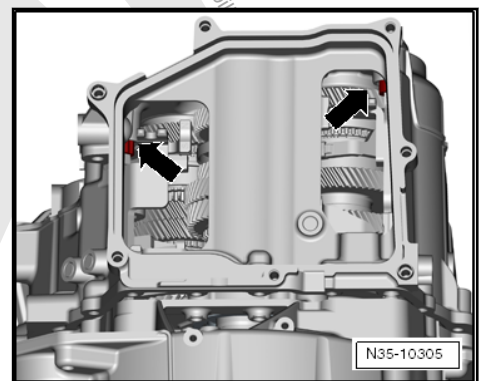
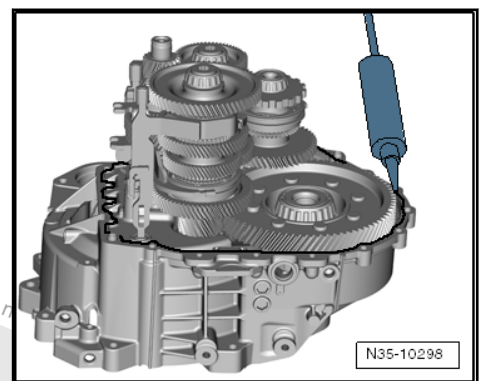
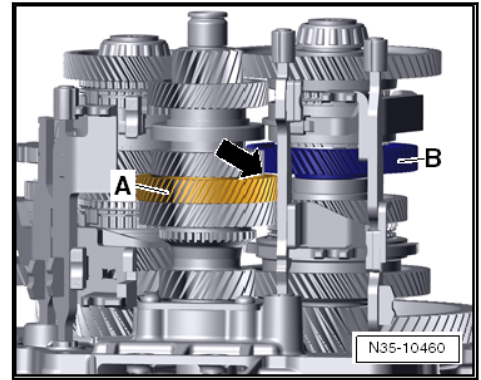
- The adhesive bead seals the oil compartment. For this reason do not coat the holes.
- Position the transmission housing.



Note

When positioning the transmission housing do not touch the cleaned flange surfaces.

- Pay attention that the shift fork is located in its bushings -arrows-.
- Place the larger inner diameter of the -VW416B- on the inner race.
- A second technician should hold the transmission housing »when pressing in« as early as possible in position.
- Using a plastic mallet drive the inner driveshaft in its bearing with targeting tapping.
- Pay attention to the seating of the guide bushings.

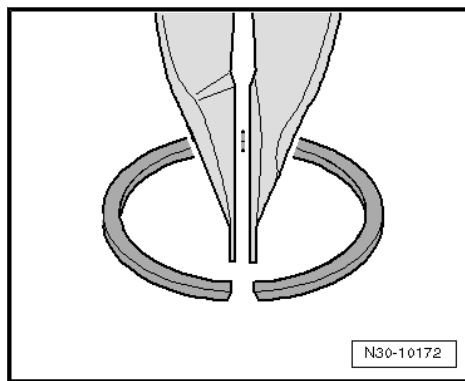




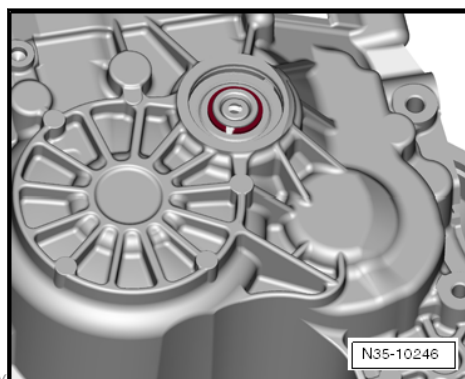
- Pay attention to the end of the circlip.

The ring is »narrower on top«. Its installation position is also the same.

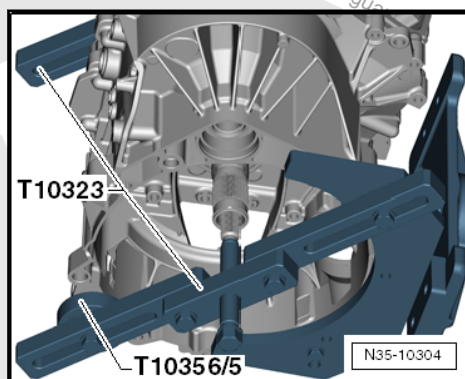
The locking ring pliers also fit better.



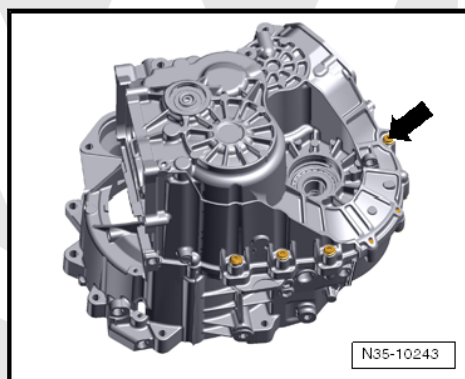
- Install the new circlip.



- Remove the -T10323- from below.

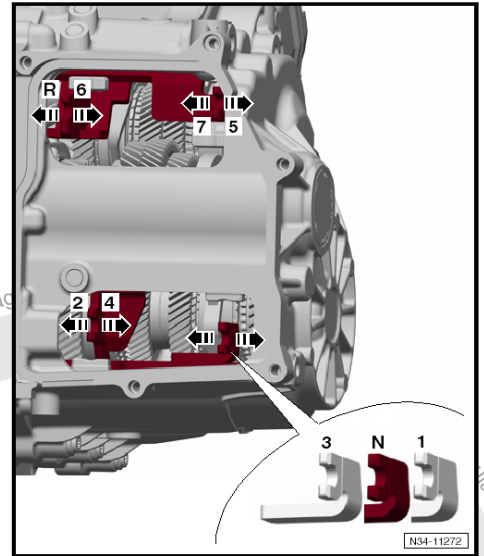


- Install the transmission housing half connecting bolts on the transmission side. Do not tighten yet.
- While tightening the transmission housing halves the second technician turns the transmission.





- To do so, engage the 1st gear.

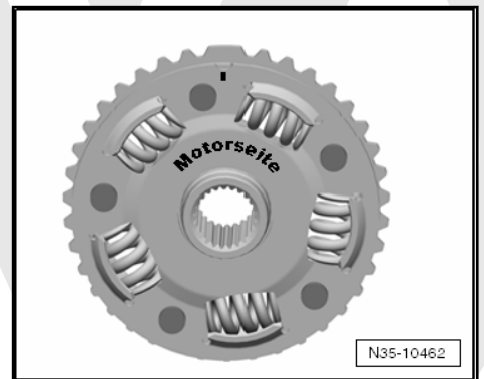


- Use the clutch to turn the hub.

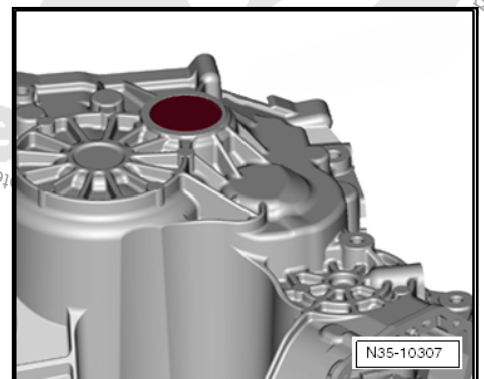
This prevents the tapered roller bearing when »placing in the bearing seat« from being damaged.

- Tighten the new connecting bolts.

Component	Tightening Specification
Steel bolts	20 Nm +45°
Aluminum bolts	10 Nm +90°



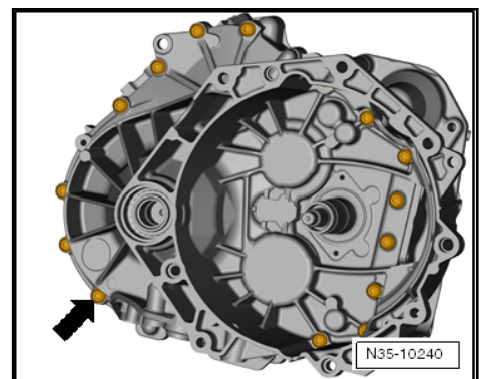
- Shift the transmission to neutral.



- Drive in the cover of the “inner driveshaft” flush.

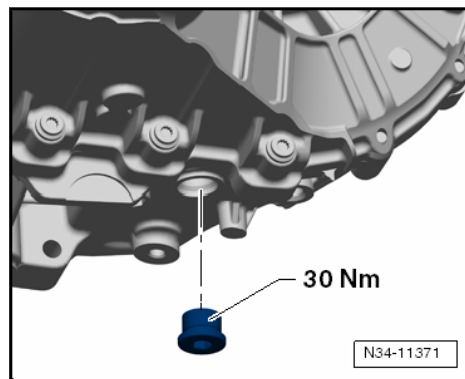
- Install the transmission housing half connecting bolts on the clutch plate.

Component	Tightening Specification
Steel bolts	20 Nm +45°
Aluminum bolts	10 Nm +90°



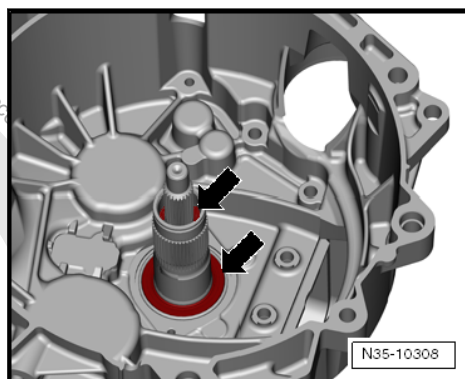


- Install the drain plug.

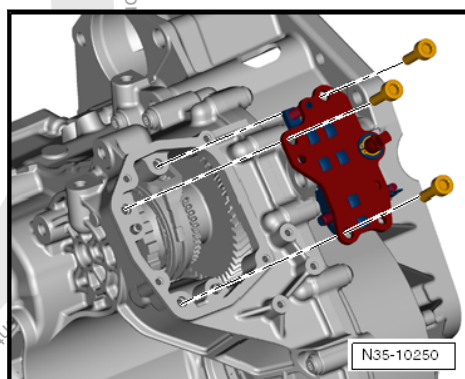


- Install the driveshaft seal.
- ◆ Input Shaft Seal, Replacing. Refer to ⇒ [“2.4 Input Shaft Seal, Replacing”, page 45](#).
- ◆ Inner Input Shaft Seal, Replacing. Refer to ⇒ [“2.5 Inner Input Shaft Seal, Replacing”, page 47](#).

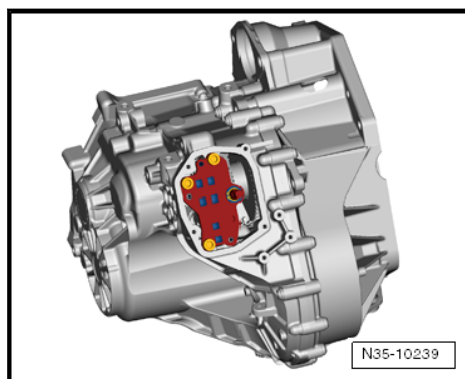
If the inner input shaft seal was already replaced, it does not need to be replaced again.



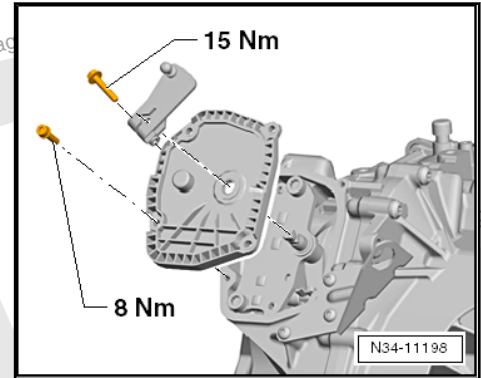
- Install the parking lock. Refer to ⇒ [“3.2 Parking Lock, Removing and Installing”, page 235](#).
- Install the Mechatronic. Refer to ⇒ [“1.2 Mechatronic, Removing and Installing”, page 56](#).
- Install the flange shafts. Refer to ⇒ [“1.1 Overview - Component Location Seals”, page 242](#).
- Install the dual clutch. Refer to ⇒ [“2.3 Dual Clutch, Installing”, page 41](#).



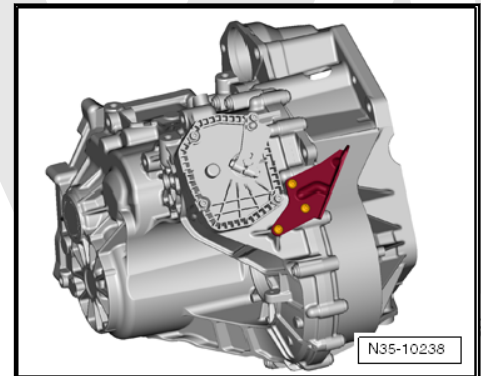
- Fill the transmission fluid via the parking lock. Capacities. Refer to ⇒ [“4.1 Capacities”, page 13](#).



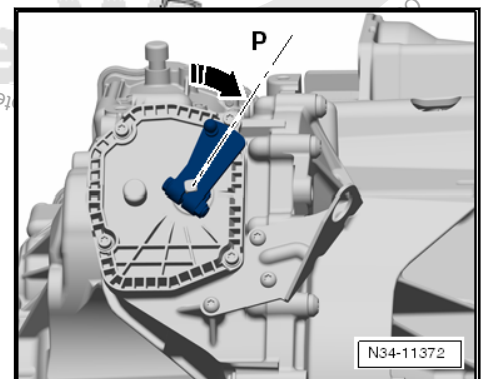
- Install the lever and cover.



- Install the cable bracket.

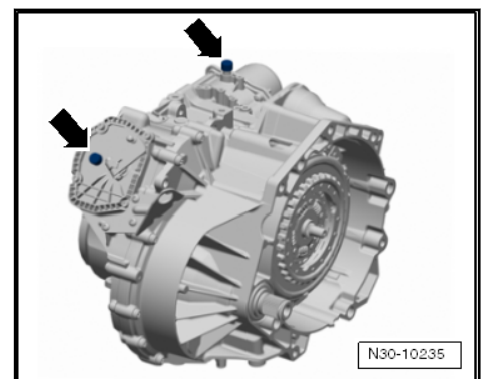


- Push the lever all the way toward the cable bracket by hand.



- Install both bleeder lines -arrows-.
- Remove the transmission from the assembly stand.

Assembly of the transmission is complete.





7 Transmission Housing and Clutch Housing

⇒ [“7.1 Overview - Transmission Housing”, page 142](#)

⇒ [“7.2 Overview - Clutch Housing”, page 144](#)

⇒ [“7.3 Transmission Housing, Servicing”, page 146](#)

⇒ [“7.4 Clutch Housing, Servicing”, page 148](#)

7.1 Overview - Transmission Housing





1 - Transmission Housing

- ❑ With oil guide. Refer to ➤ Fig. [“Installation Position of the Oil Guide in the Transmission Housing”](#), page 147.

2 - Diaphragm Plate

- ❑ The flat side faces outward.

3 - Differential Shim

- ❑ Determine thickness. Refer to ➤ [“2.5.3 Transmission Housing Shims, Determining”](#), page 213.

4 - Differential Bearing Shell

- ❑ Removing. Refer to ➤ Fig. [“Driving out the Differential Bearing Shell”](#), page 148.
- ❑ Installing. Refer to ➤ Fig. [“Driving in the Differential Bearing Shell”](#), page 148.

5 - Output Shaft 3 Shim

- ❑ Determine thickness. Refer to ➤ [“2.5.3 Transmission Housing Shims, Determining”](#), page 213.

6 - Output Shaft 3 Bearing Shell

- ❑ Removing. Refer to ➤ Fig. [“Remove the Bearing Shells of the Output Shaft”](#), page 146.
- ❑ Preparing for pressing in. Refer to ➤ Fig. [“Prepare the Bearing Shells of the Output Shaft 2 and 3 for Pressing in”](#), page 147.
- ❑ Installing. Refer to ➤ Fig. [“Pressing in the Bearing Shells of the Output Shaft 2 and 3”](#), page 147.

7 - Output Shaft 2 Shim

- ❑ Determine thickness. Refer to ➤ [“2.5.3 Transmission Housing Shims, Determining”](#), page 213.

8 - Output Shaft 2 Bearing Shell

- ❑ Removing. Refer to ➤ Fig. [“Remove the Bearing Shells of the Output Shaft”](#), page 146.
- ❑ Preparing for pressing in. Refer to ➤ Fig. [“Prepare the Bearing Shells of the Output Shaft 2 and 3 for Pressing in”](#), page 147.
- ❑ Installing. Refer to ➤ Fig. [“Pressing in the Bearing Shells of the Output Shaft 2 and 3”](#), page 147.

9 - Output Shaft 1 Shim

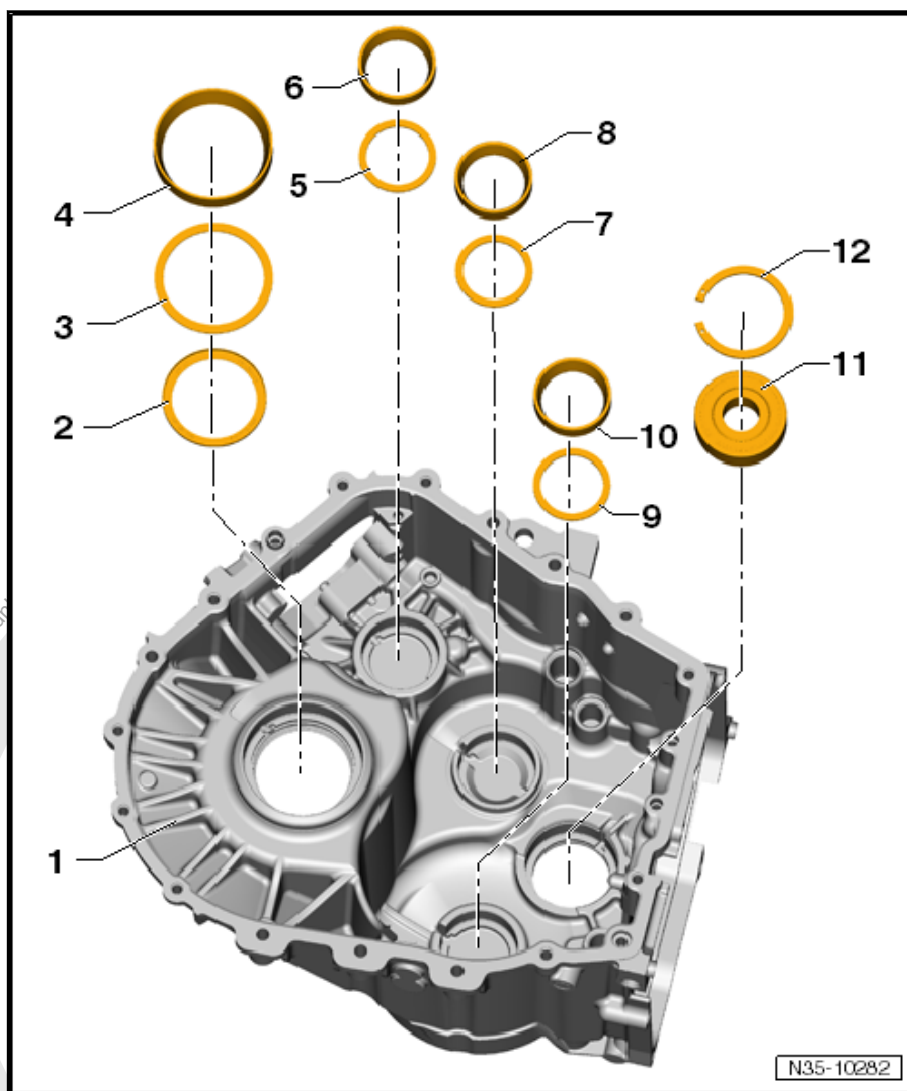
- ❑ Determine thickness. Refer to ➤ [“2.5.3 Transmission Housing Shims, Determining”](#), page 213.

10 - Output Shaft 1 Bearing Shell

- ❑ Removing. Refer to ➤ Fig. [“Remove the Bearing Shells of the Output Shaft”](#), page 146.
- ❑ Installing. Refer to ➤ Fig. [“Pressing in the Output Shaft 1 Bearing Shell”](#), page 146.

11 - Bearing for Inner Driveshaft

- ❑ Remove to press off the circlip





- ☐ Press in the »new« bearing. Refer to ⇒ [Fig. “Press in the Bearing for the Inner Input Shaft.”](#), page [146](#).

12 - Circlip

- ☐ Replace after removing

7.2 Overview - Clutch Housing





1 - Clutch Housing

2 - Diaphragm Plate

- ❑ The flat side faces outward.

3 - Bearing Race

4 - Differential Bearing Shell

- ❑ Removing. Refer to ➤ [Fig. "Driving out the Differential Bearing Shell", page 149](#).
- ❑ Installing. Refer to ➤ [Fig. "Pressing in the Differential Bearing Shell", page 150](#).

5 - Output Shaft 3 Shim

- ❑ Determine thickness. Refer to ➤ ["2.5.2 Clutch Housing Shim, Determining", page 201](#).

6 - Guide Plate

- ❑ Always replace a deformed plate

7 - Output Shaft 3 Bearing Shell

- ❑ Removing. Refer to ➤ [Fig. "Removing the Output Shaft 2 and 3 Bearing Shell", page 151](#).
- ❑ Preparing for pressing in. Refer to ➤ [Fig. "Preparing the Output Shaft 2 Bearing Shell for Pressing in", page 148](#).

- ❑ Pressing in output shaft 3. Refer to ➤ [Fig. "Pressing in the Output Shaft 3 Bearing Shell", page 149](#).

8 - Output Shaft 1 Shim

- ❑ Determine thickness. Refer to ➤ ["2.5.2 Clutch Housing Shim, Determining", page 201](#).

9 - Output Shaft 1 Bearing Shell

- ❑ Removing. Refer to ➤ [Fig. "Removing the Output Shaft 1 Bearing Shell", page 150](#).
- ❑ Preparing for pressing in. Refer to ➤ [Fig. "Preparing the Output Shaft 1 Bearing Shell for Pressing in", page 150](#).
- ❑ Installing. Refer to ➤ [Fig. "Pressing in the Output Shaft 1 Bearing Shell", page 150](#).

10 - Output Shaft 2 Shim

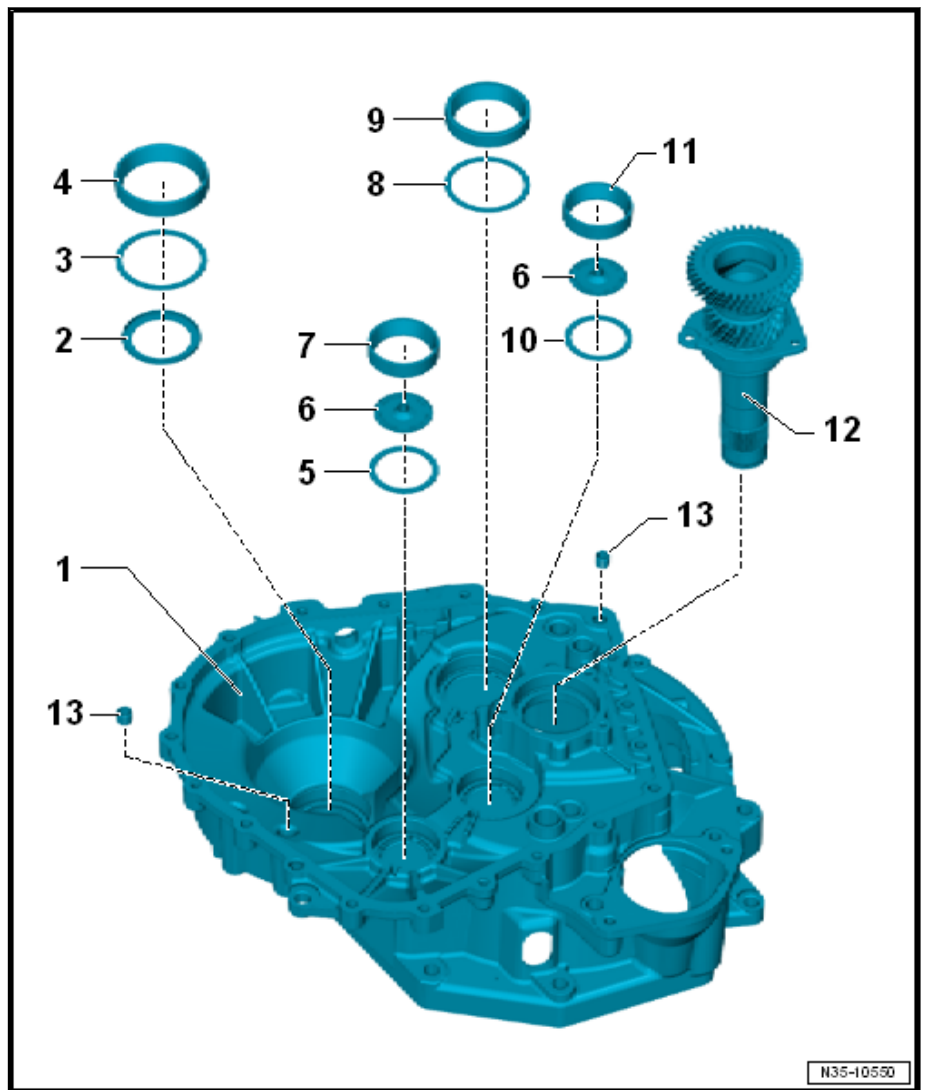
- ❑ Determine thickness. Refer to ➤ ["2.5.2 Clutch Housing Shim, Determining", page 201](#).

11 - Output Shaft 2 Bearing Shell

- ❑ Removing. Refer to ➤ [Fig. "Removing the Output Shaft 2 and 3 Bearing Shell", page 151](#).
- ❑ Preparing for pressing in. Refer to ➤ [Fig. "Preparing the Output Shaft 2 Bearing Shell for Pressing in", page 148](#).
- ❑ Pressing in output shaft 2. Refer to ➤ [Fig. "Pressing in the Output Shaft 2 Bearing Shell", page 149](#).

12 - Exterior Driveshaft

- ❑ Removing. Refer to ➤ ["6.2.1 Transmission, Disassembling", page 124](#).
- ❑ Installing. Refer to ➤ ["6.2.2 Transmission, Assembling", page 131](#).





- ❑ Disassembling and Assembling. Refer to ⇒ [“1.1.1 Outer Driveshaft, Disassembling and Assembling”](#), [page 168](#) .

13 - Centering Bushing

- ❑ Quantity: 2

7.3 Transmission Housing, Servicing

Special tools and workshop equipment required

- ◆ Press Plate - VW402-
- ◆ Press Piece - Multiple Use - VW473-
- ◆ Slide Hammer - Press Plate - 2050-
- ◆ Wedge - T10357-
- ◆ -1- Internal Puller - VAS251613- (Kukko 21-6)
- ◆ -4- Counter Support - VAS251623- (Kukko 22-2)
- ◆ Bearing Installer - Pinion Bearing - VW470-
- ◆ Seal Installer - Hollow Shaft - T10380-
- ◆ Thrust Piece - T10428-

Remove the Bearing Shells of the Output Shaft

All bearing shells of the output shaft 1 to 3 are removed »in the same way«. Here the output shaft 1 is shown as an example. The bearing shells of the output shaft 2 and 3 are also removed this way.

Pay attention that the bearing shell does not catch on the support from the puller.

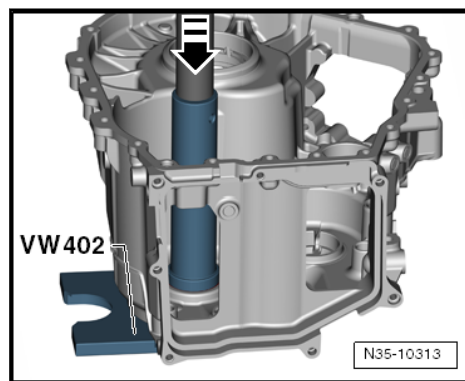
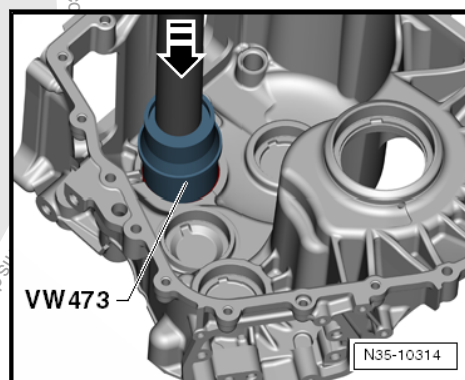
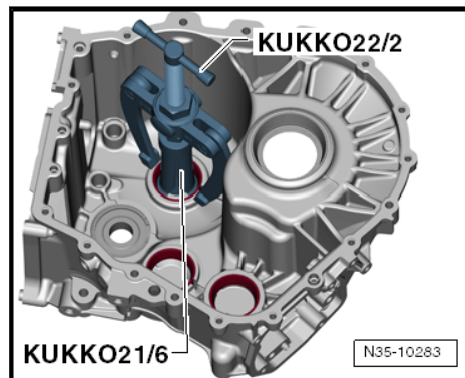
Press in the Bearing for the Inner Input Shaft.

Press in the bearing all the way.

Install the »new« circlip.

Pressing in the Output Shaft 1 Bearing Shell

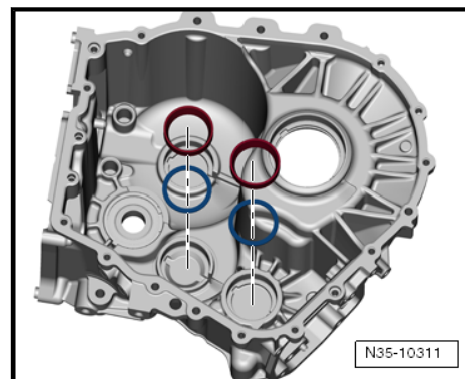
- Insert the shim.
- Press in the bearing shell all the way.



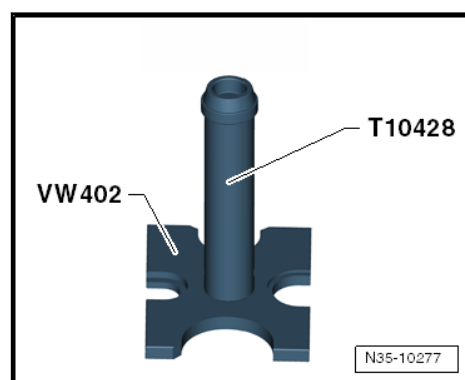


Prepare the Bearing Shells of the Output Shaft 2 and 3 for Pressing in

- First insert the shim in the housing.
- Then position the »correct« bearing shell and drive in using targeted tapping, so that it can no longer fall out.



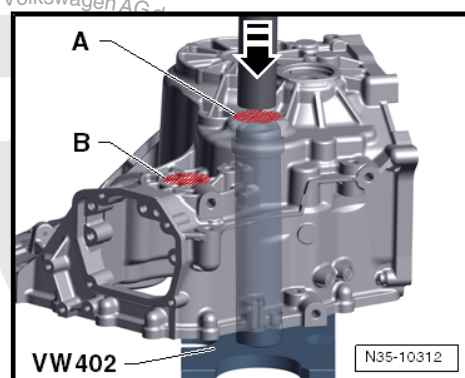
- Position the -T10428- with -VW402- on the pressing table.



Pressing in the Bearing Shells of the Output Shaft 2 and 3

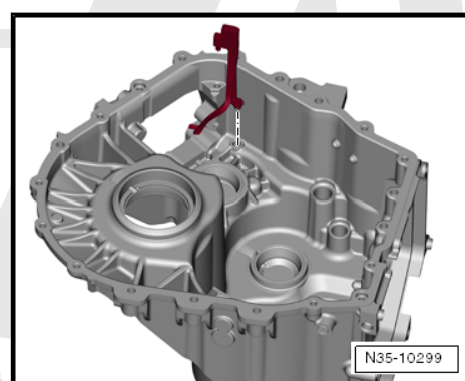
To press in position the transmission housing with the bearing shell on the Thrust Piece - T10428- .

- A- Output shaft 2 bearing shell
- B- Output shaft 3 bearing shell



Installation Position of the Oil Guide in the Transmission Housing

- The oil guide is clipped in the housing.

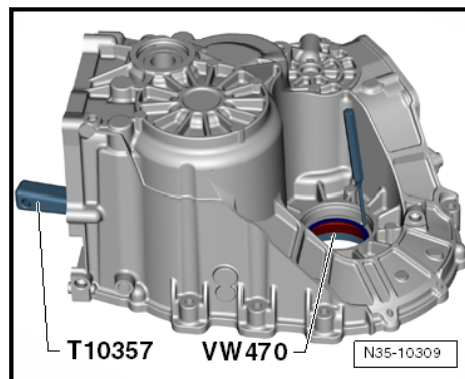




Driving out the Differential Bearing Shell

The bearing is driven out using a suitable drift.

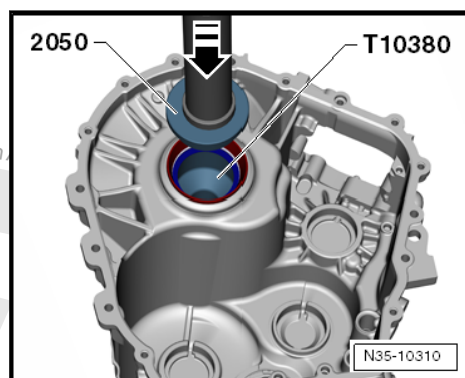
- Before driving out the ring position the -VW470- under the bearing.
- So that the transmission housing does not tip, place the -T10357- additionally under the housing.



Driving in the Differential Bearing Shell

To drive in a second technician is required.

- Position the -T10380- on the rim of the work bench. Place on the thrust piece in the bearing area in the transmission housing and hold the housing securely.
- 1. The second technician positions the oil ring and shim. 2. The technician drives the bearing in all the way.



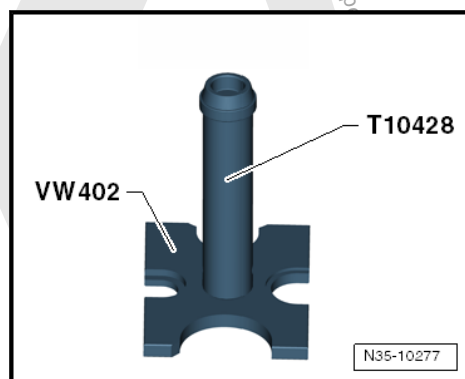
7.4 Clutch Housing, Servicing

Special tools and workshop equipment required

- ◆ Slide Hammer - Press Plate - 2050-
- ◆ -1- Internal Puller - VAS251613- (Kukko 21-6)
- ◆ -1- Internal Puller - VAS251615- (Kukko 21-7)
- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - 60mm - VW415A-
- ◆ Press Piece - Multiple Use - VW455-
- ◆ Press Piece - VW472/1-
- ◆ Thrust Piece - T10428-

Preparing the Output Shaft 2 Bearing Shell for Pressing in

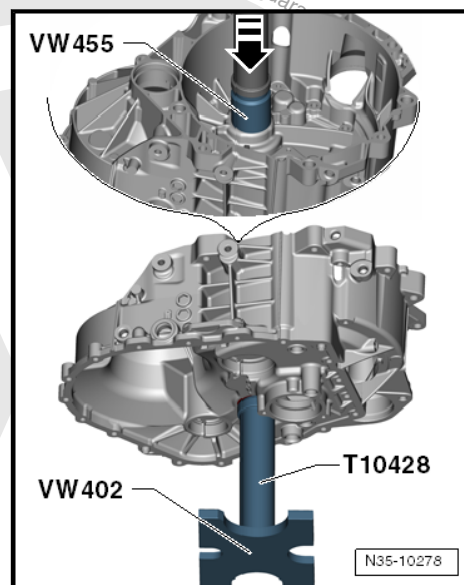
- First position the -T10428- on the pressing table.
- Position the shim and the guide plate.
- Then drive in the bearing shell carefully using a drift until it no longer falls out.



Pressing in the Output Shaft 2 Bearing Shell

- Place the clutch housing »upside down« on the -T10428- .

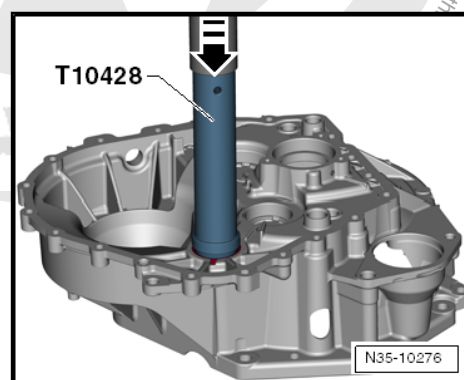
So that the pressure is transferred controlled in the clutch housing use the -VW455- .



Pressing in the Output Shaft 3 Bearing Shell

- Insert the guide plate beforehand.

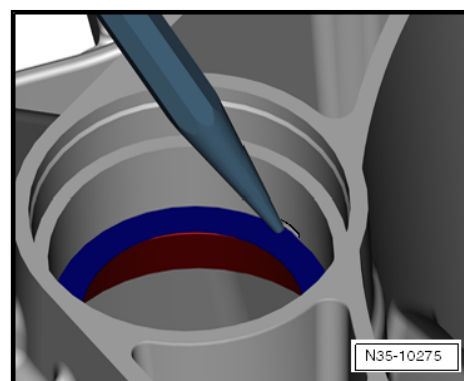
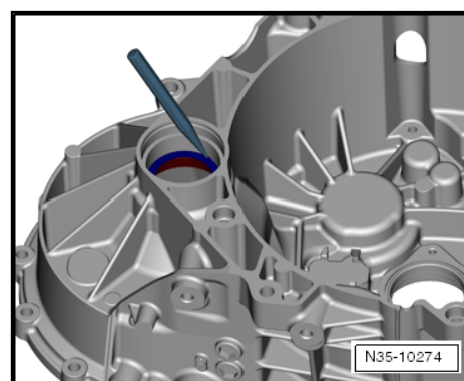
A shim is located under the bearing.



Driving out the Differential Bearing Shell

- Remove the bearing using a suitable drift.

The diaphragm plate is damaged at the same time and must be replaced.



WARNING

A baring race with a 0.65 mm thickness is installed between the diaphragm plate and the bearing shell. The baring race must be placed in the same position before pressing in the bearing shell.



Pressing in the Differential Bearing Shell

Removing the Output Shaft 1 Bearing Shell

A shim is located under the bearing.

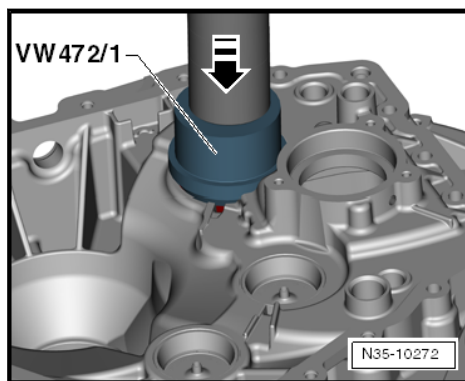
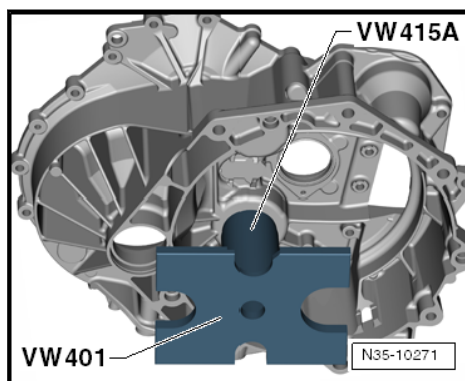
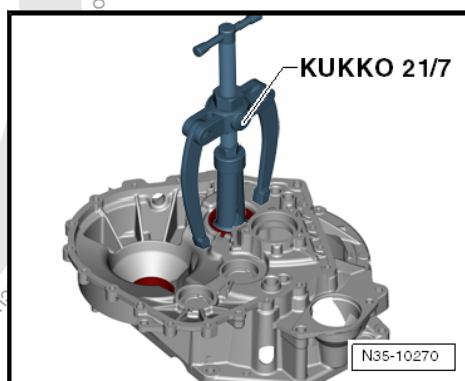
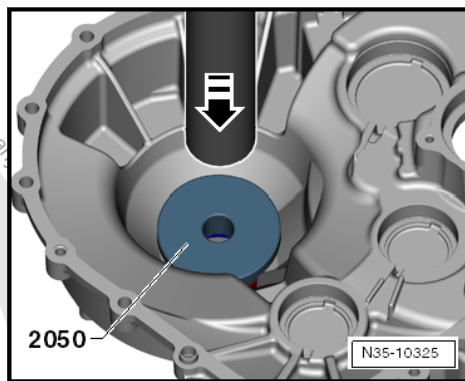
Preparing the Output Shaft 1 Bearing Shell for Pressing in

- First place the -VW415A- under the bearing seat.

This image shows the view »from below«. This assures the pressure is not transferred uncontrolled into the clutch housing but rather absorbed by the sleeve.

Pressing in the Output Shaft 1 Bearing Shell

- Insert the determined shim when the thickness is already known.



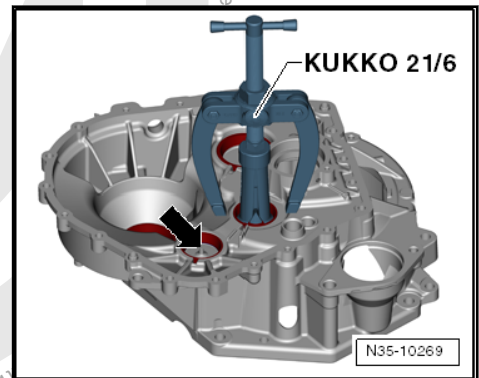
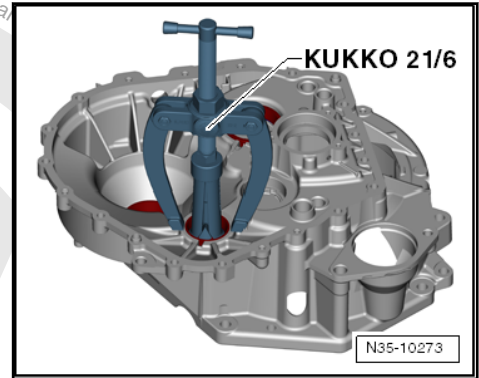
Removing the Output Shaft 2 and 3 Bearing Shell

A shim is located under the bearing.



Note

It can be the case that the guide plates interfere with the internal puller when positioning. Then carefully drive down the baffles with a hammer. Deformed areas must then be replaced when installing.





8 Securing on Engine and Transmission Holder

⇒ "8.1 Securing on Engine and Transmission Holder", page 152

8.1 Securing on Engine and Transmission Holder

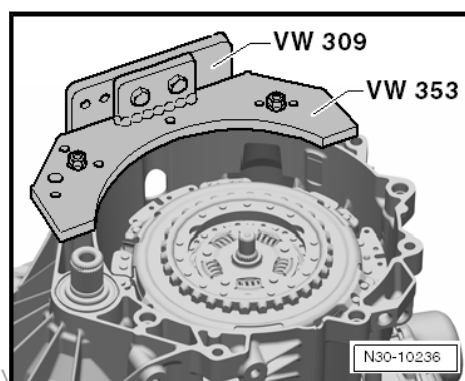
Special tools and workshop equipment required

- ◆ Holding Plate - VW309A-
- ◆ Transmission Support - VW353-
- ◆ Engine Sling - 2024A-
- ◆ Lifting Eyebolt - 3368-
- ◆ Engine and Gearbox Bracket - VAS6095A-
- ◆ Shop Crane - VAS6100-

Secure the transmission on the Transmission Support - VW353- .

Requirement:

- The transmission is sealed so that no fluid can leak out.
Refer to ⇒ [page 121](#) .

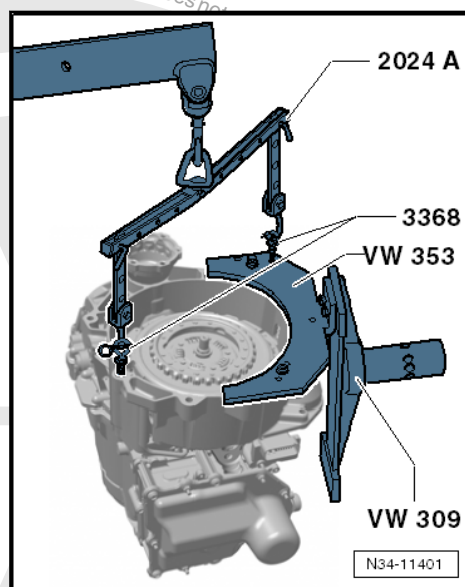


Lift the Transmission into the Engine/Transmission Holder.

Requirement:

- The transmission is sealed so that no fluid can leak out.
Refer to ⇒ [page 121](#) .

The transmission is lifted using the Shop Crane - VAS6100- together with the Transmission Support - VW353- into the Engine And Transmission Holder - VAS6095- .





9 Transmission Fluid

⇒ "9.1 Transmission Fluid, Draining and Filling", page 153

⇒ "9.2 Mechatronic Hydraulic Fluid, Draining and Filling", page 157

9.1 Transmission Fluid, Draining and Filling

Special tools and workshop equipment required

- ◆ Used Oil Collection and Extraction Unit - SMN372500-
- ◆ Oil Filler - VAS6262A- with Adapter For Oil Filling - VAS6262/4-
- ◆ Adapter VAS6262/7 - VAS6262/7-
- ◆ It may be necessary to shorten the bleed pipe on the Adapter For Oil Filling - VAS6262A- . Refer to ⇒ [page 153](#) .
- ◆ Container with the transmission fluid for the 7-speed DSG® transmission 0CG. For the part number. Refer to the Parts Catalog.

Measure the Length of the Bleed Pipe on the Oil Filler - VAS6262A- . Shorten it if Necessary.

Shorten the pipe to dimension -a-. This assures the pipe on the Oil Filler - VAS6262A- will not touch the bottom on some oil containers.

- Dimension -a- = 210 mm

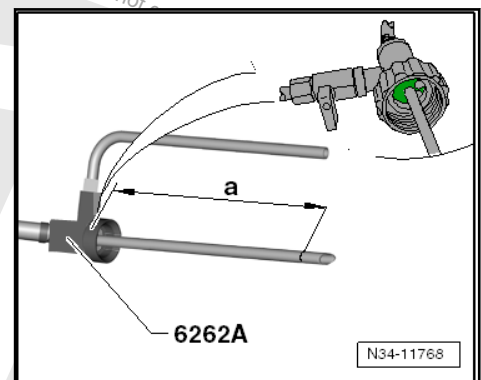


Note

Dimension -a- is measured starting from the shaft (the green surface) on the Adapter For Oil Filling - VAS6262A- .

If dimension -a- is greater than 210 mm:

- Make a mark on the bleed pipe, dimension -a-, and cut it, with for example the Brake Line Tool Kit - Pipe Cutter - VAS6056/2- .





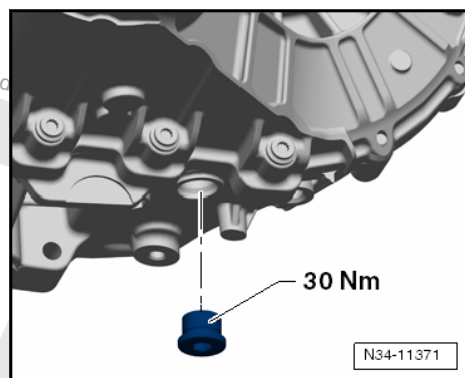
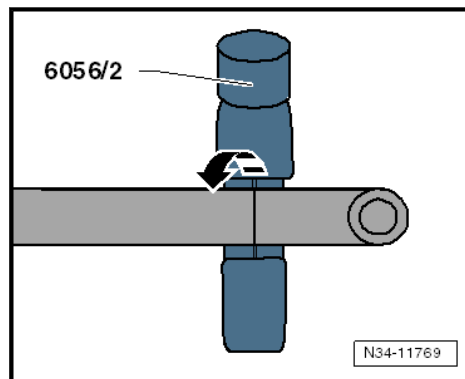
- Clean the Oil Filler - VAS6262A- .

Procedure



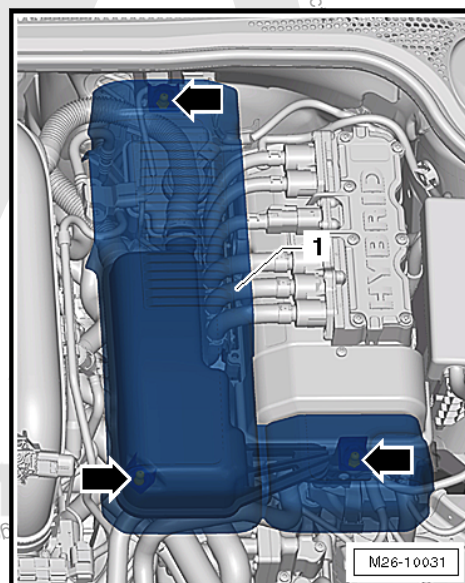
Note

- ◆ Pay attention to ⇒ **“3 Repair Information”, page 6** .
 - ◆ The transmission fluid is a permanent filling.
 - ◆ It is not possible to check the transmission fluid level.
 - ◆ If the transmission is leaking, find the cause and correct it.
 - ◆ After that it is necessary to drain all the transmission fluid and fill it again.
- The engine is off.
 - Move the selector lever into “P”.
 - Remove the noise insulation below engine/transmission. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
 - Place the Used Oil Collection and Extraction Unit - SMN372500- under the transmission.
 - Remove the drain plug from the transmission.
 - Drain the fluid and then install the drain plug and tighten it.



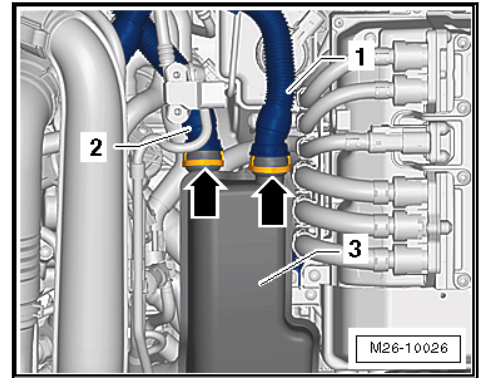
- Unclip and remove the damper cover -1- upward from the retainers -arrows-

Vehicles with Secondary Air Injection (AIR) System





- Squeeze the locking ring -arrows- on both sides and remove the air lines -1 and 2- from the damper -3-.



- Remove the damper -1- upward from the rubber bushings -arrows-.

For All Vehicles



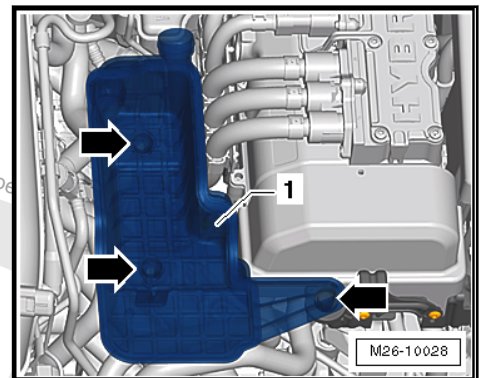
WARNING

Beware of the danger of electrocution.

An electrical shock can result in death.

Follow the High Voltage System General Warnings. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System General Warnings .

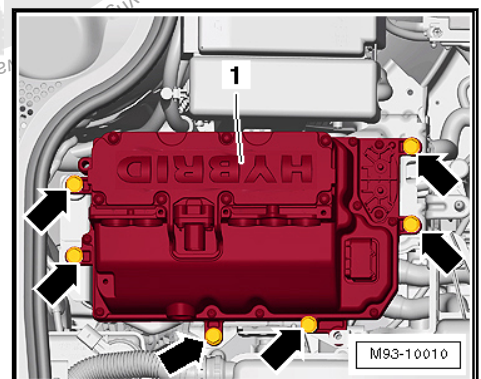
- ◆ ***A high voltage technician must de-energize the high voltage system before any work can be performed on the high voltage system or before any servicing work can be performed on the body.***
- ◆ ***Only hybrid electrically instructed persons may perform all work on a vehicle with a high voltage system. All work must be performed by a high voltage technician.***



WARNING

High voltage at the high voltage system of the hybrid vehicle. Danger of electrocution! The following procedure requires work on the high voltage system. To de-energize the high voltage system. Refer to ⇒ Hybrid Electrical System; Rep. Gr. 93 ; High Voltage System, De-energizing .

- Remove the Electric Drive Power and Control Electronics - JX1- . Refer to ⇒ Electrical Equipment; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .



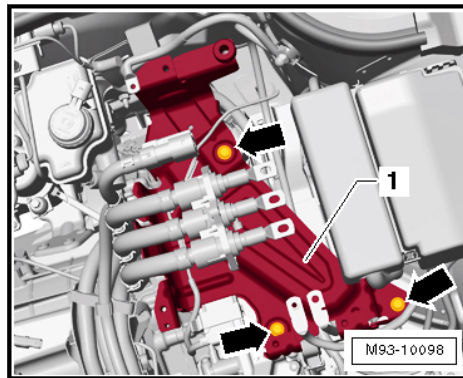


- Remove the bracket for the Electric Drive Power and Control Electronics - JX1- . Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage Cables; High Voltage Battery High Voltage Cable Set, Removing and Installing .



Note

- ◆ *It is not possible to check the transmission fluid level.*
- ◆ *Fill the fluid exactly to the specified quantity.*
- ◆ *This assures the transmission is filled correctly.*
- ◆ *Underfilling or overfilling the transmission fluid will cause the transmission to malfunction.*



Caution

Danger of causing damage to the transmission.

- ◆ **Use only the transmission fluid specifically for the 7-speed DSG® transmission 0CG. It is available as a replacement part. Refer to the Parts Catalog.**
- ◆ **Using other fluids can cause malfunctions or transmission failure.**

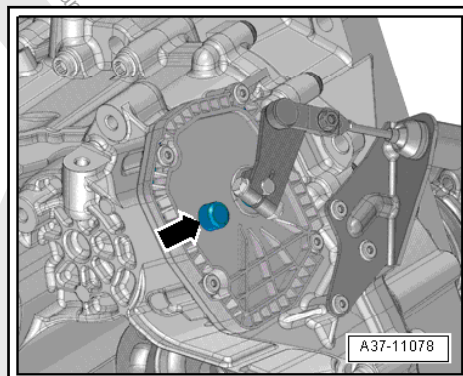
- Remove the bleed cap -arrow- next to the transmission gearshift lever.



Caution

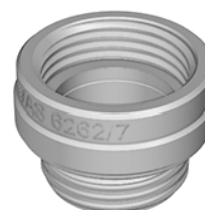
Danger of causing damage to the transmission.

- ◆ **The Oil Filler - VAS6262A- with the Adapter For Oil Filling - VAS6262/4- must be clean and transmission fluid must not be mixed with another fluid!**



- Shake before opening.
- Install the Adapter - VAS6262/7- on the bottle.
- Hold the container so that no fluid can run into the filling hose.

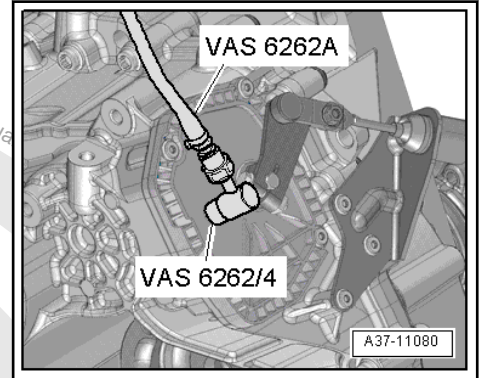
VAS 6262/7



W00-11643

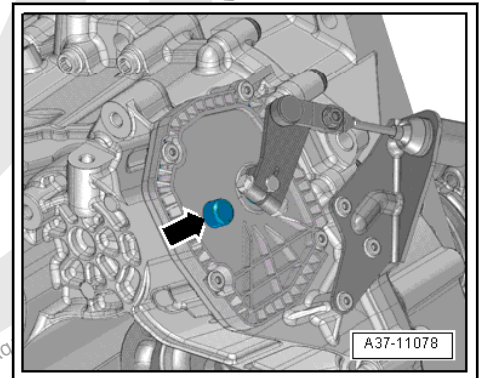


- Connect the Adapter For Oil Filling - VAS6262/4- to the filling hose and mount it on the bleeder on the transmission.
- Turn the container around and fill the exact capacity.



Capacities	
Fluid capacities	Refer to Service References in Elsa2Go.

- Remove the Oil Filler - VAS6262A- after filling. Wipe the area around the bleed hole with a clean cloth and install the cap -arrow-.
- The rest of the installation is performed in reverse order of removal. When doing this, install the Electric Drive Power and Control Electronics - JX1- . Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .
- Energize the high voltage system and complete the required documentation. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System, Energizing .



9.2 Mechatronic Hydraulic Fluid, Draining and Filling

Special tools and workshop equipment required

- ◆ Used Oil Collection and Extraction Unit - SMN372500-
- ◆ Engine Bung Set - VAS6122-
- ◆ Funnel, Commercially Available



The Mechatronic hydraulic fluid is permanently filled. It is not possible to check the fluid level.



Caution

Risk of causing damage to the Mechatronic.

- ◆ ***Only the hydraulic fluid for the Mechatronic that is available as a replacement part may be used. Refer to the Parts Catalog.***
- ◆ ***Using other fluids can cause malfunctions or Mechatronic failure.***
- ◆ ***Checking the hydraulic fluid level in the Dual-Clutch Transmission Mechatronic - J743- is not possible. The vent on the Dual-Clutch Transmission Mechatronic - J743- must be sealed tight for performing any assembly work. Fluid that has leaked out of the DSG Transmission Mechatronic - J743- hydraulic area may not be checked.***
- ◆ ***Fluid that has leaked out can only be adjusted correctly when changing the hydraulic fluid. It is not possible to check the fluid level.***
- ◆ ***Under filling or overfilling will impair the function of the Mechatronic.***

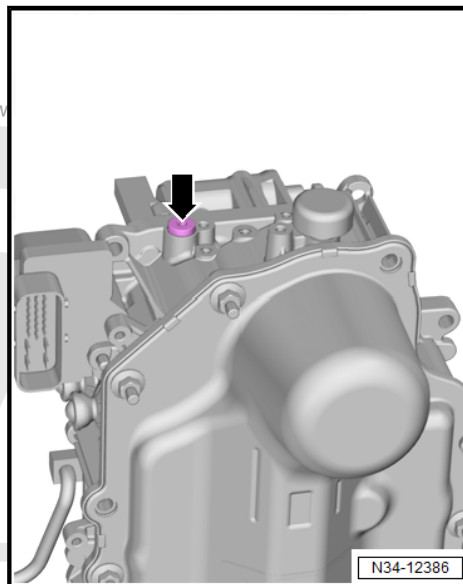
Requirements

- ◆ Mechatronic is removed. Refer to ➔ [“1.2 Mechatronic, Removing and Installing”, page 56](#) .

Draining Hydraulic Fluid

- Remove the oil filler plug -arrow-.

Replace the bolt after removing.





- Remove the cap from the bleeder -arrow- if not removed.



WARNING

On some transmissions, the breather cap on the Mechatronic is destroyed during removal and must be replaced.



Note

The fluid flows when turning the Mechatronic out of the oil filler hole and the bleed hole. Pay attention that both openings are held in the pan of the Used Oil Collection and Extraction Unit - SMN372500-.

- Turn the Mechatronic and let the fluid drain out completely.

Filling the Hydraulic Fluid:



Note

First fill new oil after all repairs are completed on the Mechatronic.

- After the fluid is completely drained out, turn the Mechatronic again. The fluid filler hole points upward.
- Insert a commercially available clean funnel in the fluid filler hole.

Shake the fluid bottles before opening them.

- Fill one liter hydraulic fluid.
- Install the new oil filler plug.



Caution

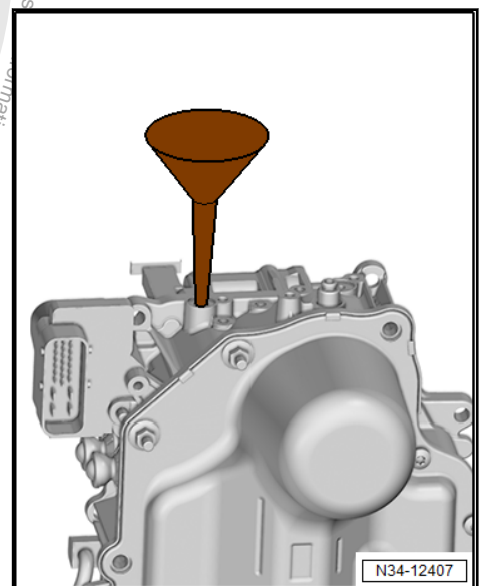
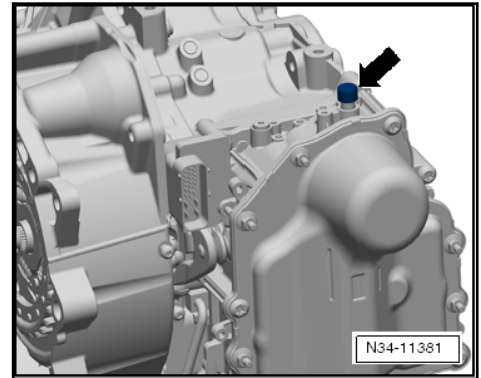
Risk of causing damage to the Mechatronic.

- ◆ *Fluid that has leaked out can only be adjusted correctly when changing the hydraulic fluid. It is not possible to check the fluid level.*
- ◆ *Under filling or overfilling will impair the function of the Mechatronic.*

- Seal the Mechatronic vent with clean plugs from the Engine Bung Set - VAS6122- oil tight. When installing it prevents oil from dripping out of the hole unintentionally.
- Install the Mechatronic. Refer to ⇒ [“1.2 Mechatronic, Removing and Installing”, page 56](#).

Tightening Specifications

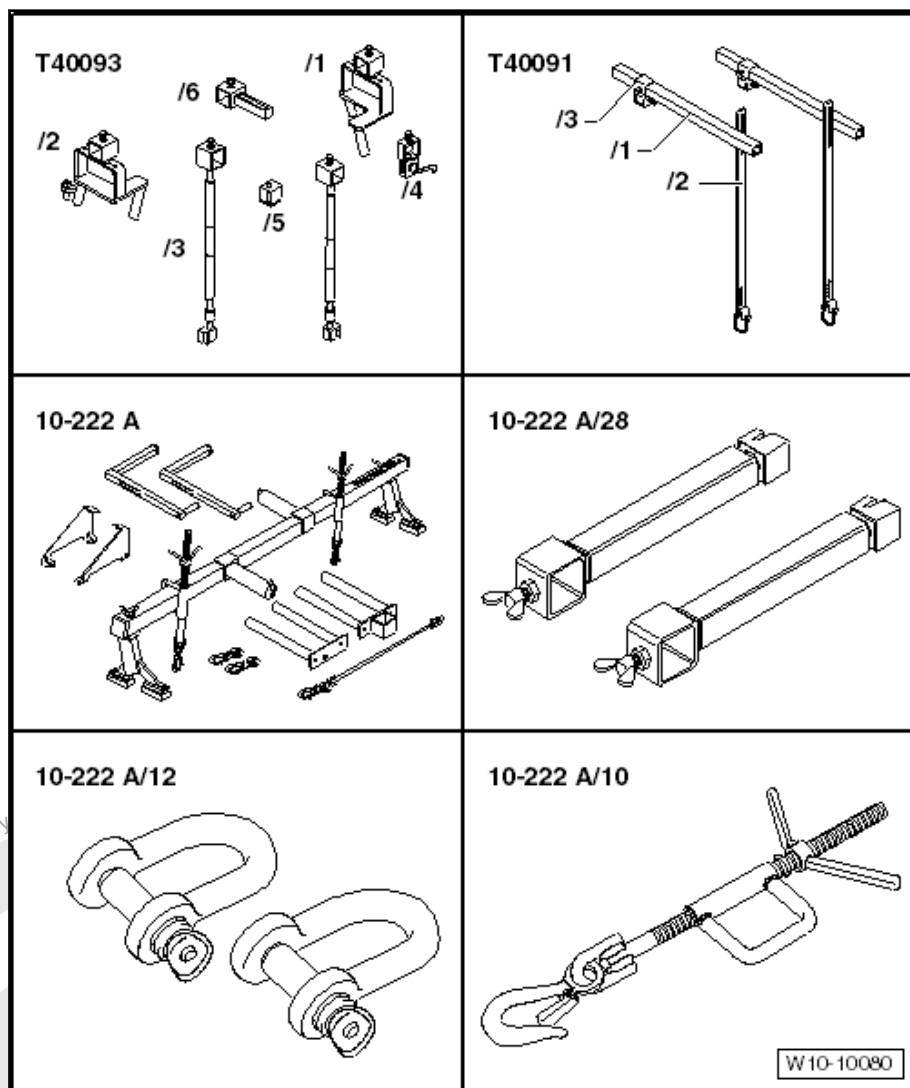
Component	Tightening Specification
Oil Filler Plug	5 Nm +90°





10 Special Tools

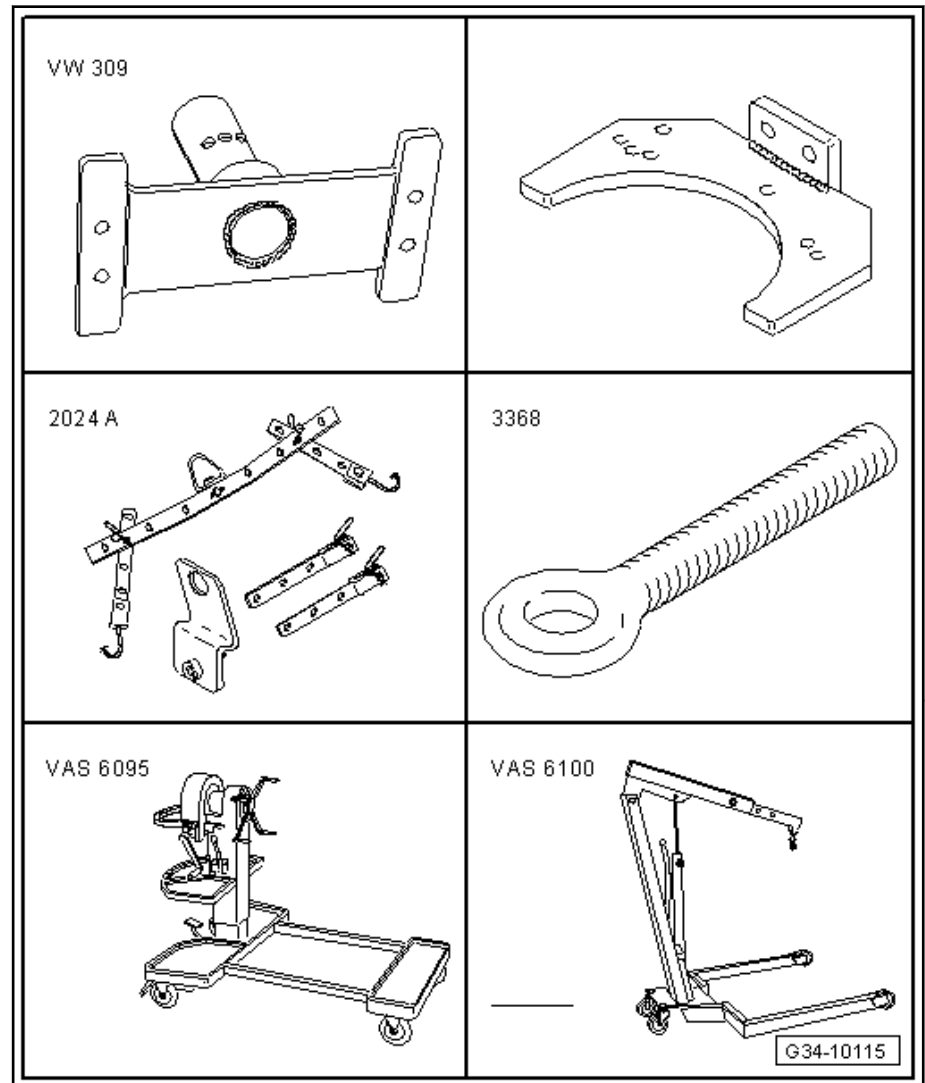
Special tools and workshop equipment required



- ◆ Engine Support Bridge - 10-222A-
- ◆ Engine Support Bridge - Spindle - 10-222A/11- quantity: 2
- ◆ Engine Support Bridge - Engine Support 28 - 10-222A/28- quantity: 2
- ◆ Engine Support Bridge - Engine Support 28-2 - 10-222A/28-2- quantity: 2
- ◆ Engine Support Bridge - Engine Support 31 - 10-222A/31-
- ◆ Engine Support - Basic Set - Rail with Holes - T40091/2- from the Engine Support - Basic Set - T40091-
- ◆ Engine Support - Supplement Kit Mount 5 - T40093/5- from the Engine Support - Supplement Kit - T40093A-
- ◆ Square Pipe - T40091/1- (quantity 2) from the Engine Support - Basic Set - T40091-
- ◆ Movable Joint - T40091/3- (quantity 2) from the Engine Support - Basic Set - T40091-



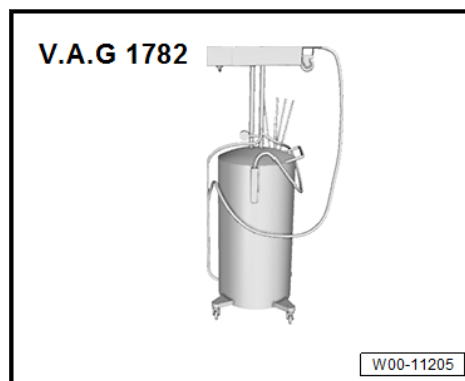
- ◆ Movable Joint - T40093/4- (quantity 2) from the Engine Support - Supplement Kit - T40091-



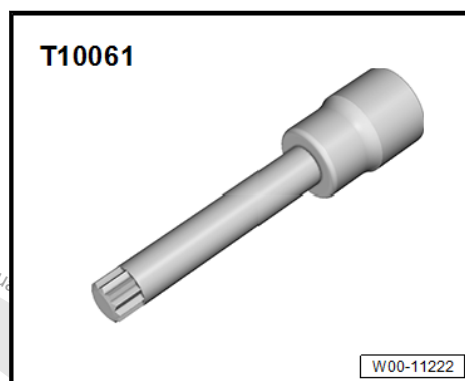
- ◆ Holding Plate - VW309A-
- ◆ Transmission Support - VW353-
- ◆ Engine Sling - 2024A-
- ◆ Lifting Eyebolt - 3368-
- ◆ Engine And Transmission Holder - VAS6095-
- ◆ Shop Crane - VAS6100-



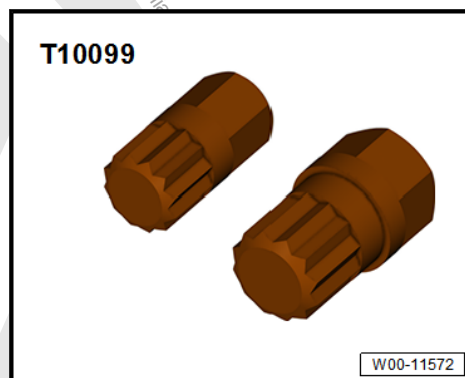
- ◆ Used Oil Collection and Extraction Unit - SMN372500-



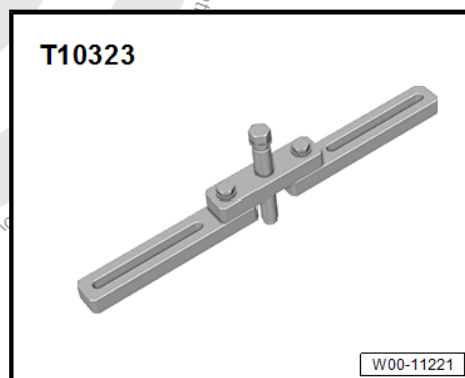
- ◆ Socket - Xzn 14 - T10061-



- ◆ Bits for VAG1331/13 - T10099-

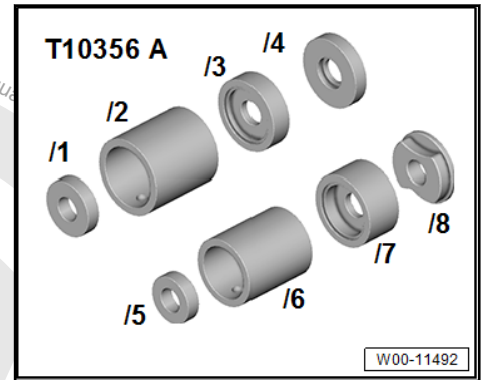


- ◆ Support Bridge - T10323-

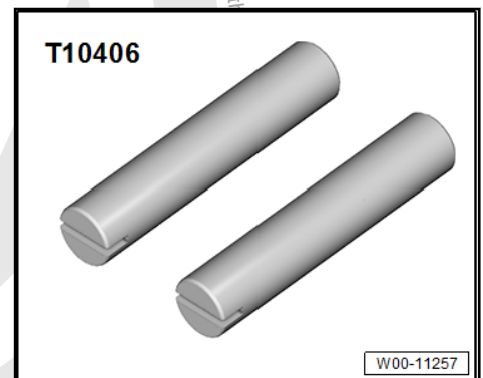




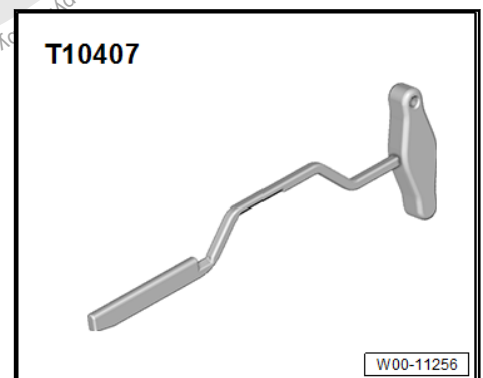
◆ Assembly Tool - Component 5 - T10356A/5-



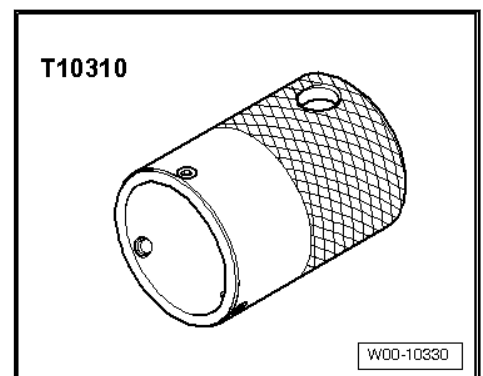
◆ Guide Bolt - Mechatronic - T10406-



◆ Assembly Lever - Mechatronic - T10407-

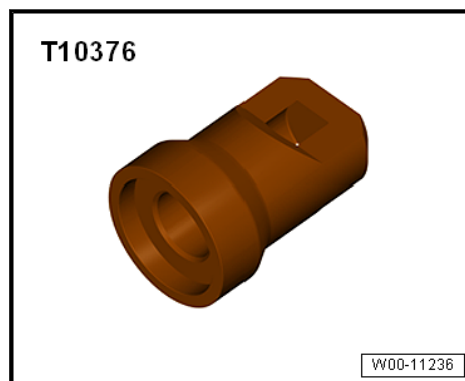


◆ Socket - T10310-

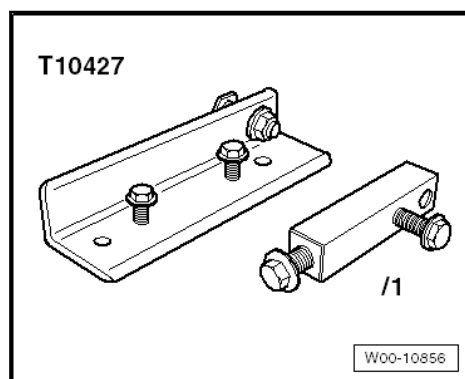




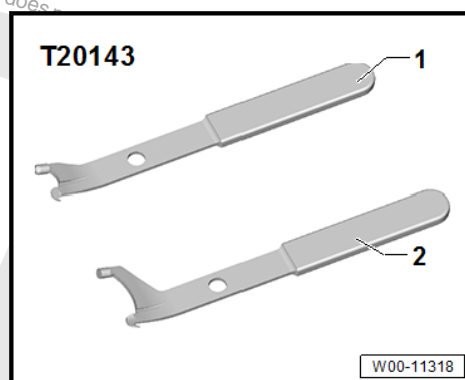
◆ Clutch Press Piece - T10376-



◆ Press Tool - T10427-



◆ Puller - Crankshaft/Power Steering Seal - T20143/2-



◆ Hot Air Blower - VAG1416-

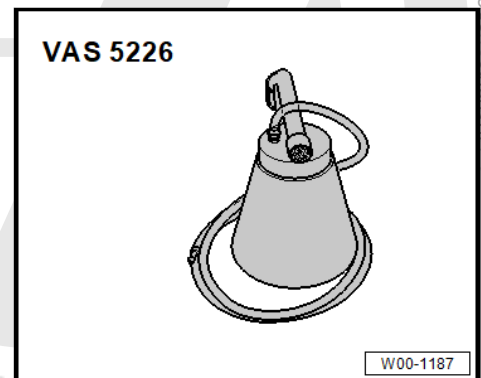




◆ Cartridge Gun - VAG1628-



◆ Suction Pump - VAS5226-



◆ Oil Filler - VAS6262A- with Adapter For Oil Filling VAS6262/4-

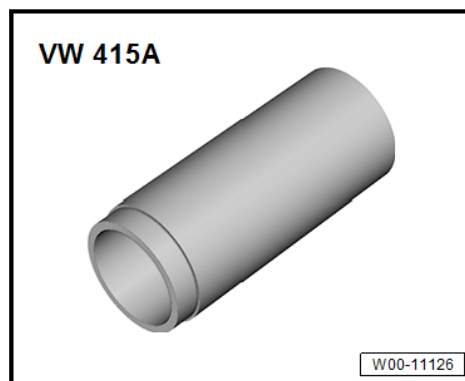


◆ Adapter VAS6262/7 - VAS6262/7-

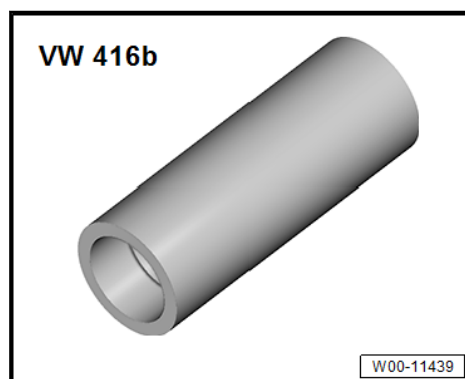




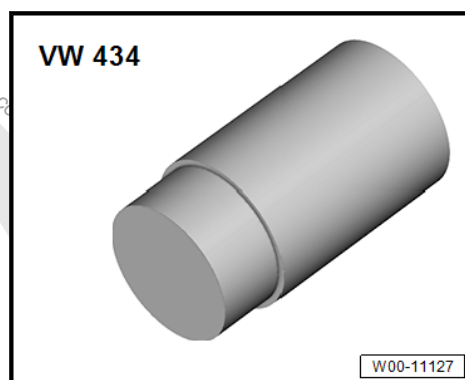
- ◆ Press Piece - 60mm - VW415A-



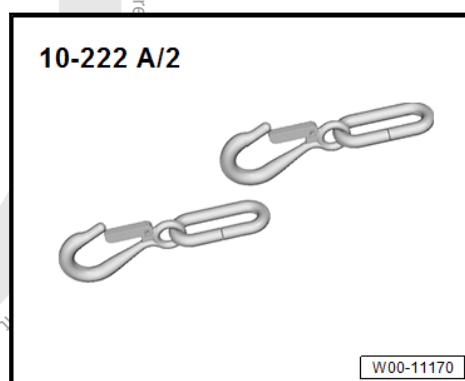
- ◆ Press Piece - 37mm - VW416B-



- ◆ Press Piece - Bushing - VW434-

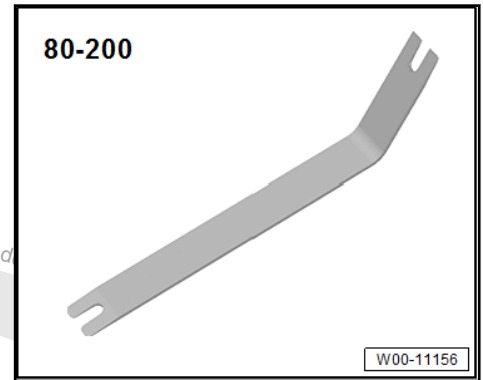


- ◆ Engine Support Bridge - Additional Hooks (2 pc.) - 10-222A/2-

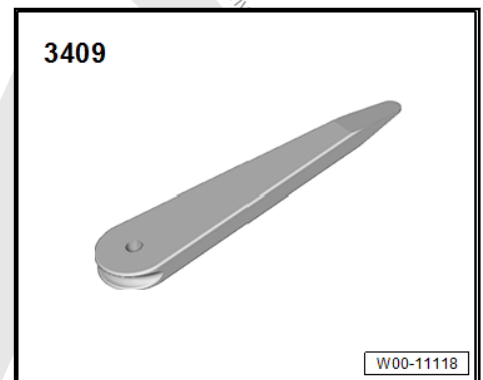




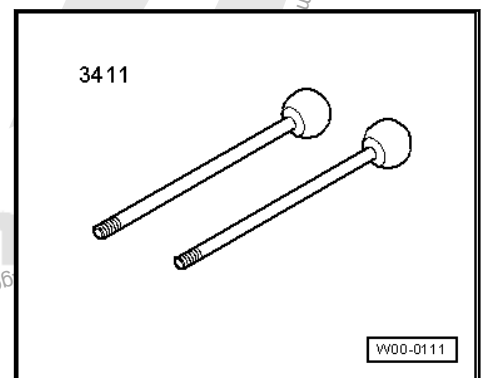
◆ Pry Lever - 80-200-



◆ Trim Removal Wedge - 3409-



◆ Lock Carrier Support Tool - 3411-



◆ Vehicle Diagnostic Tester



35 – Gears, Shafts

1 Driveshaft

⇒ [“1.1 Driveshaft, Disassembling and Assembling”, page 168](#)

1.1 Driveshaft, Disassembling and Assembling

⇒ [“1.1.1 Outer Driveshaft, Disassembling and Assembling”, page 168](#)

⇒ [“1.1.2 Inner Driveshaft, Disassembling and Assembling”, page 170](#)

1.1.1 Outer Driveshaft, Disassembling and Assembling

Special tools and workshop equipment required

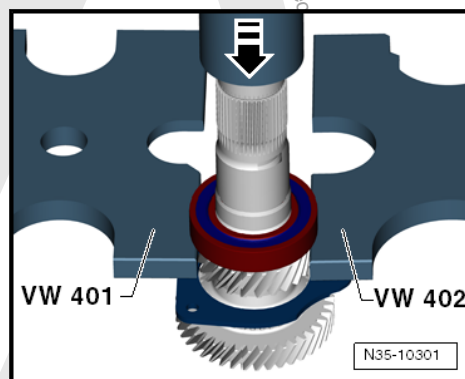
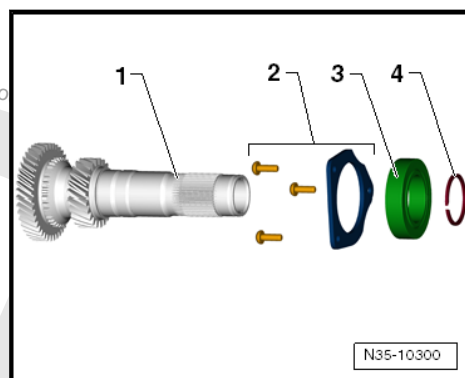
- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Reverse Gear Syncro - 3296-
- ◆ Multi-Pin Connector Tool - T10211-

Overview

- 1 - Exterior Driveshaft
- 2 - Retaining plate with bolts: lettering points toward the gear - flat side to the bearing. Tightening specification: 8 Nm + 90°
- 3 - Bearing: pressing off (refer to ⇒ [Fig. “Outer Driveshaft - Pressing Off Bearing”](#), page 168), pressing on (refer to ⇒ [Fig. “Outer Driveshaft - Install the New Bearing All the Way”](#), page 169)
- 4 - Circlip determining thickness. Refer to ⇒ [Fig. “Fitting the Circlip.”](#), page 169 .

Outer Driveshaft - Pressing Off Bearing

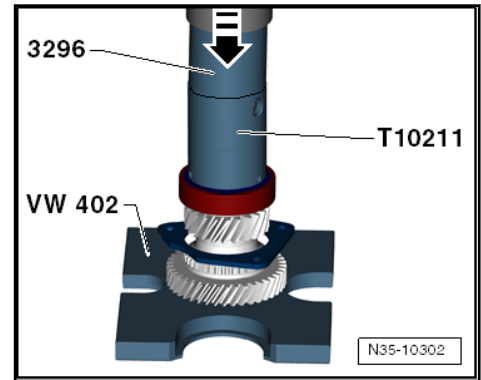
The bearing will be damaged when it is removed and must be replaced.





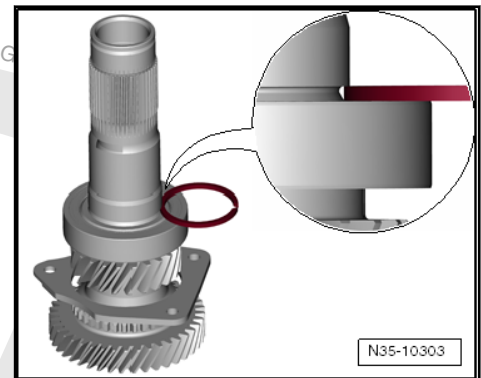
Outer Driveshaft - Install the New Bearing All the Way

- Press on the bearing only via the inner race.
- The plate lettering points to the gears.

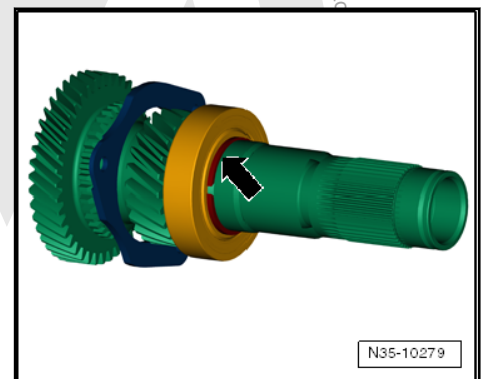


Fitting the Circlip.

The goal is to secure the bearing without play using the circlip.
For this find the ring that fits in the groove without play.



- Push the ring all around in the groove.





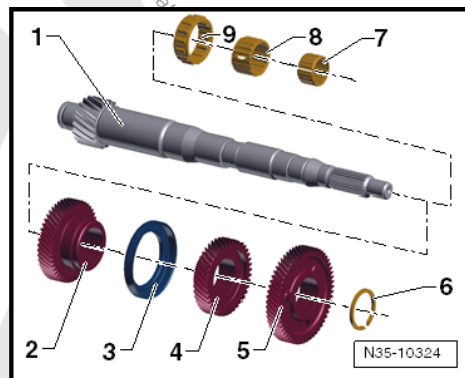
1.1.2 Inner Driveshaft, Disassembling and Assembling

Special tools and workshop equipment required

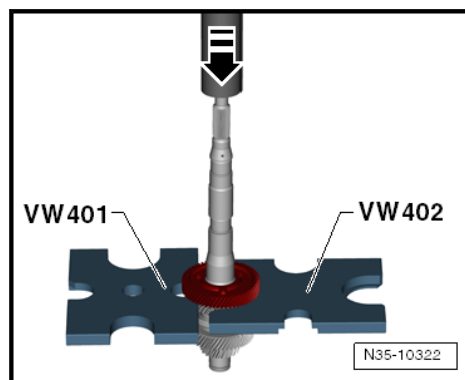
- ◆ Press Plate - VW401-
- ◆ Press Plate - VW402-
- ◆ Press Piece - 60mm - VW415A-
- ◆ Support Channels - VW457-
- ◆ Press Piece - Front Control Arm - 2040-

Overview

- 1 - Inner Driveshaft
- 2 - 5th Gear Wheel: does not need to be pressed off to clean. Pressing off (refer to ⇒ Fig. [“Removing the 5th Gear”](#), page 171), pressing on (refer to ⇒ Fig. [“Installing the 5th Gear”](#), page 172).
- 3 - Sensor wheels: does not need to be removed to be cleaned. Pry out using the lever: press on (refer to ⇒ Fig. [“Drive the Sensor Ring on the cooled 5th Gear Wheel”](#), page 172) always replace the removed sensor ring.
- 4 - 3rd Gear Wheel: Pressing off (refer to ⇒ Fig. [“Removing the 3rd Gear”](#), page 171), pressing on (refer to ⇒ Fig. [“Installing the 3rd Gear”](#), page 171).
- 5 - 7th Gear Wheel: Pressing off (refer to ⇒ Fig. [“Removing the 7th Gear”](#), page 170), pressing on (refer to ⇒ Fig. [“Installing the 7th Gear”](#), page 171).
- 6 - Circlip
- 7 - Needle Cage
- 8 - Needle Cage; »Large« Needle
- 9 - Roller Cage



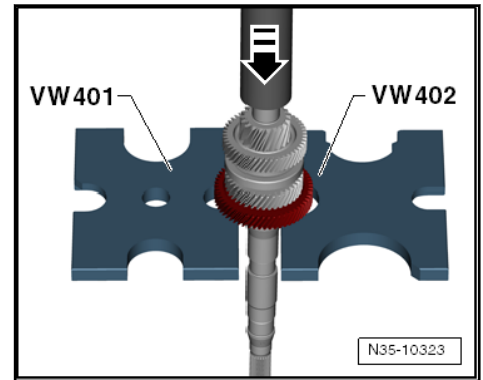
Removing the 7th Gear



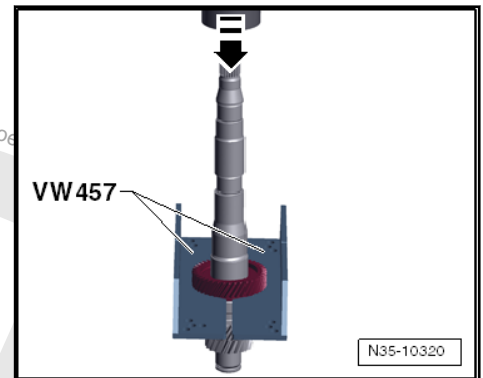


Installing the 7th Gear

- Carefully press on all the way.

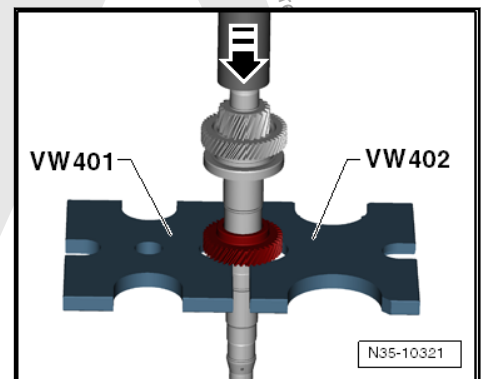


Removing the 3rd Gear

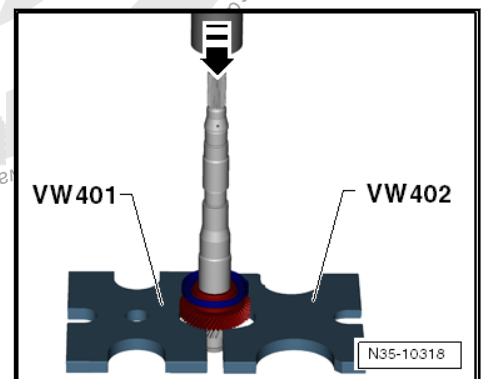


Installing the 3rd Gear

- Carefully press on all the way.



Removing the 5th Gear

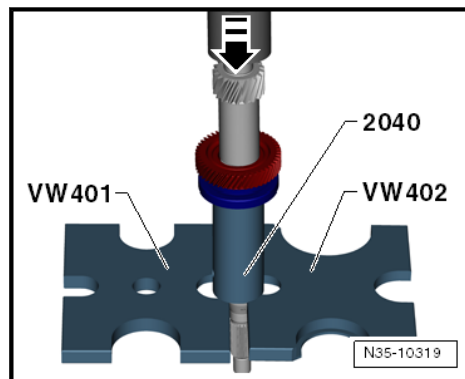




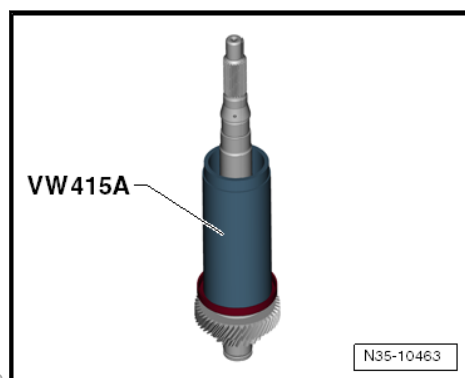
Installing the 5th Gear

- Warm to 140° to press on.
- Carefully press on all the way.
- Align the -2040- on the -VW401- so that the shaft can be pushed through downward without »rubbing«.

Use the -VW402- to secure the sleeve.



Drive the Sensor Ring on the »cooled« 5th Gear Wheel





2 Output Shaft

⇒ ["2.1 Overview - Output Shaft", page 173](#)

⇒ ["2.2 Output Shaft 1, Disassembling and Assembling", page 179](#)

⇒ ["2.3 Output Shaft 2, Disassembling and Assembling", page 188](#)

⇒ ["2.4 Output Shaft 3, Disassembling and Assembling", page 195](#)

⇒ ["2.5 Output Shaft, Adjusting", page 199](#)

2.1 Overview - Output Shaft

⇒ ["2.1.1 Overview - Output Shaft 1", page 173](#)

⇒ ["2.1.2 Overview - Output Shaft 2", page 175](#)

⇒ ["2.1.3 Overview - Output Shaft 3", page 177](#)

2.1.1 Overview - Output Shaft 1

1 - Output Shaft 1

2 - Needle Bearing

3 - 2nd Gear Wheel

4 - Synchronizer Ring

5 - Outer race

6 - Synchronizer Ring

7 - Locking Collar and Syn-
chronizer Hub for 2nd and 4th
Gears

- Disassembling and As-
sembling. Refer to ⇒
"2.2.4 Locking Collars
and Synchronizer Hub
for Output Shaft 1,
Disassembling and As-
sembling", page 188 .

8 - Synchronizer Ring

9 - Outer Race

10 - Synchronizer Ring

11 - Needle Bearing

12 - Needle Bearing Sleeve

13 - 4th Gear Wheel

14 - Washer

- To press in the out-
put shaft the shaft is
assembled up to this
washer.

15 - Needle Bearing

16 - Needle Bearing Sleeve

17 - 3rd Gear Wheel

18 - Synchronizer Ring

19 - Outer Race

20 - Synchronizer Ring

21 - Locking Collar and 1st and 3rd Gear Synchronizer Hub

- Disassembling and Assembling. Refer to ⇒ "2.2.4 Locking Collars and Synchronizer Hub for Output Shaft 1, Disassembling and Assembling", page 188 .

22 - Synchronizer Ring

23 - Outer race

24 - Synchronizer Ring

25 - Needle Bearing

26 - Needle Bearing Sleeve

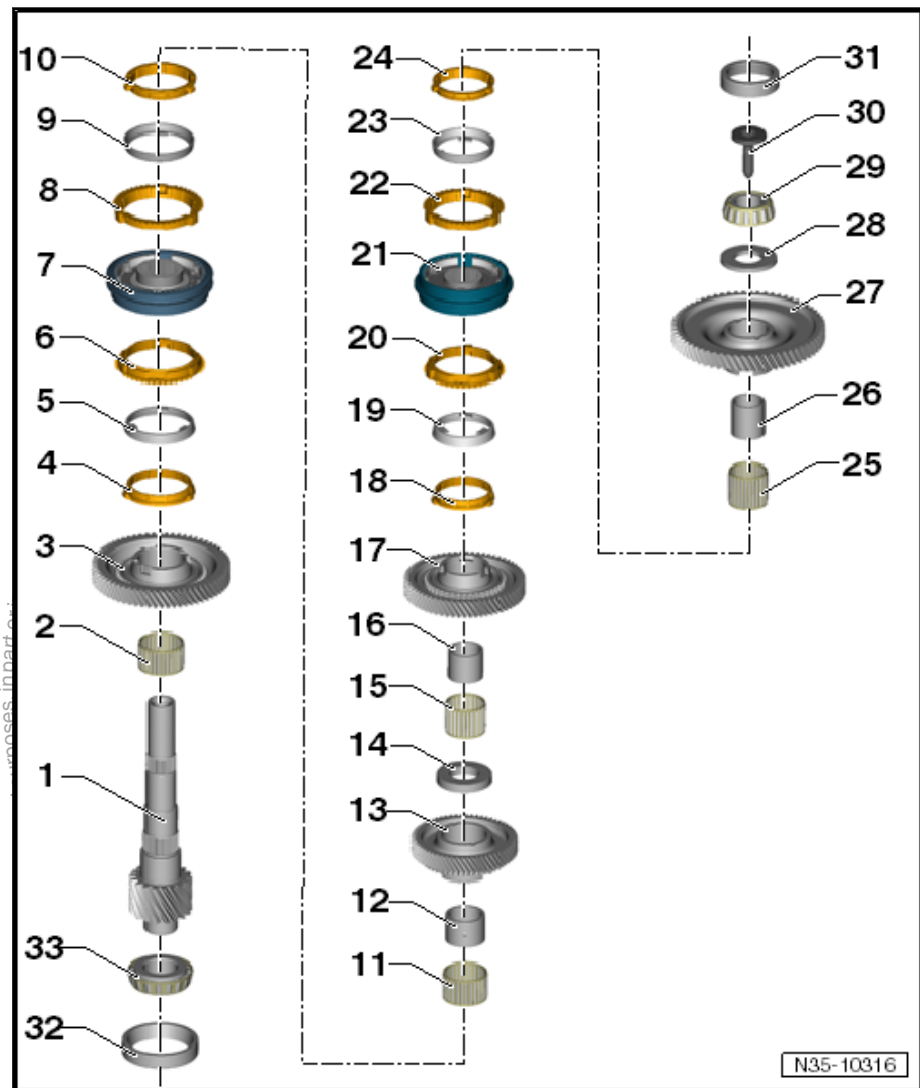
27 - 1st Gear Wheel

28 - Thrust Washer

29 - Bearings

- Always replace the bearing from a shaft together.

30 - Bolt





- ☐ 60 Nm +90°
- ☐ Always replace after removing.
- ☐ Removing. Refer to ⇒ [“2.2.1 Output Shaft 1, Partially Disassembling”, page 179](#) .
- ☐ Installing. Refer to ⇒ [“2.2.3 Output Shaft 1, Assembling”, page 182](#) .

31 - Bearing Shell

- ☐ Removing and Installing. Refer to ⇒ [“7.3 Transmission Housing, Servicing”, page 146](#) .
- The bearing shells may not be interchanged. They are paired with the bearing.

32 - Bearing Shell

- ☐ Removing and Installing. Refer to ⇒ [“7.4 Clutch Housing, Servicing”, page 148](#) .
- The bearing shells may not be interchanged. They are paired with the bearing.

33 - Bearings

- ☐ Always replace the bearing from a shaft together.
- ☐ Removing. Refer to ⇒ [page 182](#) .
- ☐ Installing. Refer to ⇒ [page 182](#) .

2.1.2 Overview - Output Shaft 2





1 - Output Shaft 2

2 - Axial Needle Bearing

3 - Needle Bearing

4 - Reverse Drive Gear

5 - Washer

6 - Locking Collar and 6th Gear Synchronizer Hub

- ❑ Disassembling and Assembling. Refer to ⇒ ["2.3.3 Locking Collars and Synchronizer Hub for Output Shaft 2, Disassembling and Assembling"](#), page 195 .

7 - Synchronizer Ring

8 - Needle Bearing

9 - Needle Bearing Sleeve

10 - 6th Gear Wheel

11 - Washer

- ❑ To press in the output shaft the shaft is assembled up to this washer.

12 - Needle Bearing

13 - Needle Bearing Sleeve

14 - 7th Gear Wheel

15 - Synchronizer Ring

16 - Locking Collar and Synchronizer Hub for 5th and 7th Gears

- ❑ Disassembling and Assembling. Refer to ⇒ ["2.3.3 Locking Collars and Synchronizer Hub for Output Shaft 2, Disassembling and Assembling"](#), page 195 .

17 - Synchronizer Ring

18 - Needle Bearing

19 - Needle Bearing Sleeve

20 - 5th Gear Wheel

21 - Bearings

- ❑ Always replace the bearing from a shaft together.

22 - Bolt

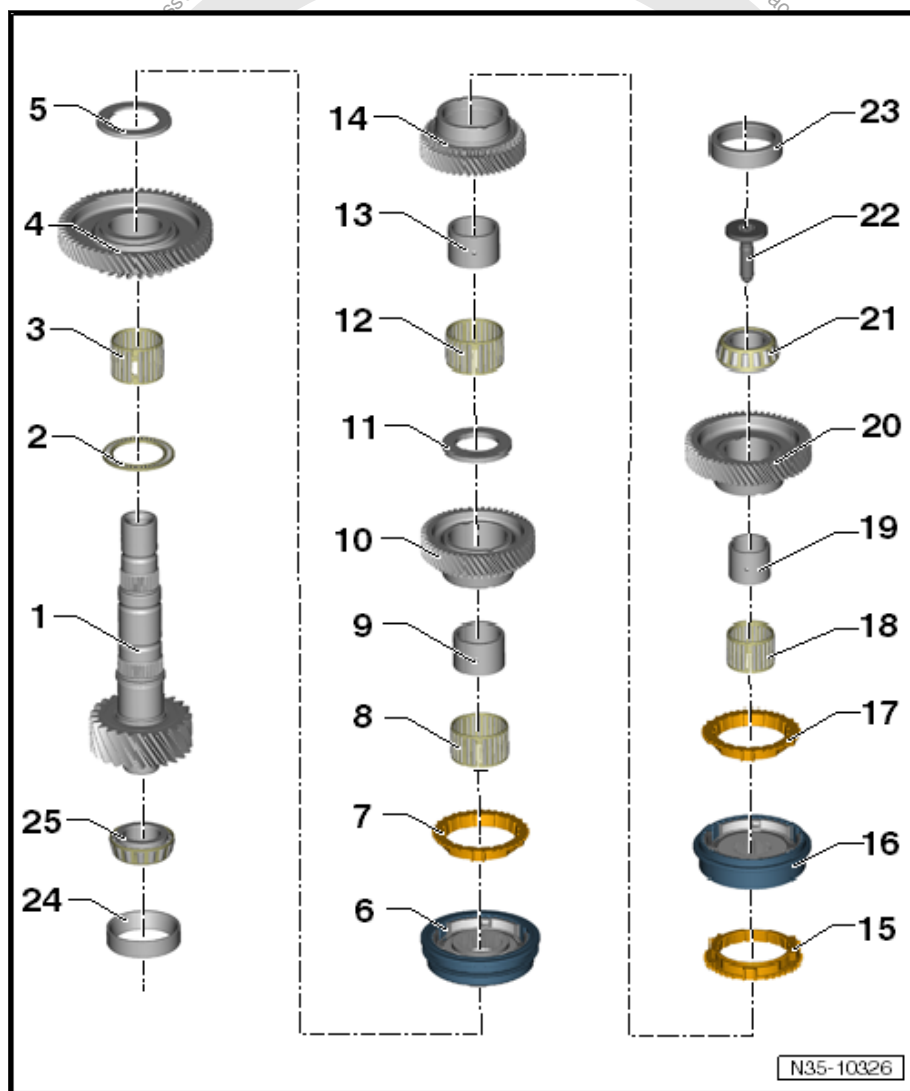
- ❑ 60 Nm +90°
- ❑ Always replace after removing.
- ❑ Removing. Refer to ⇒ ["2.3.1 Output Shaft 2, Disassembling"](#), page 188 .
- ❑ Installing. Refer to ⇒ ["2.3.2 Output Shaft 2, Assembling"](#), page 190 .

23 - Bearing Shell

- ❑ Removing and Installing. Refer to ⇒ ["7.3 Transmission Housing, Servicing"](#), page 146 .

- The bearing shells may not be interchanged. They are paired with the bearing.

24 - Bearing Shell





❑ Removing and Installing. Refer to ⇒ [“7.4 Clutch Housing, Servicing”, page 148](#) .

- The bearing shells may not be interchanged. They are paired with the bearing.

25 - Bearings

- ❑ Always replace the bearing from a shaft together.
- ❑ Removing. Refer to ⇒ [page 189](#) .
- ❑ Installing. Refer to ⇒ [page 190](#) .

2.1.3 Overview - Output Shaft 3





1 - Output Shaft 3

2 - Needle Bearing

3 - Reverse Gear Wheel

4 - Synchronizer Ring

5 - Locking Collar and Reverse Gear Synchronizer Hub

- ❑ Disassembling and Assembling. Refer to ⇒ ["2.4.3 Locking Collar and Synchronizer Hub for Output Shaft 3, Disassembling and Assembling"](#), page 199.

6 - Circlip

7 - Stop Ring

8 - Parking lock gear

- ❑ The flat side points to the shaft end, »rounded« side to the gear wheel for the reverse gear.

9 - Bearings

- ❑ Always replace the bearing from a shaft together.

10 - Bearing Shell

- ❑ Removing and Installing. Refer to ⇒ ["7.3 Transmission Housing, Servicing"](#), page 146.

- The bearing shells may not be interchanged. They are paired with the bearing.

11 - Bearing Shell

- ❑ Removing and Installing. Refer to ⇒ ["7.4 Clutch Housing, Servicing"](#), page 148.

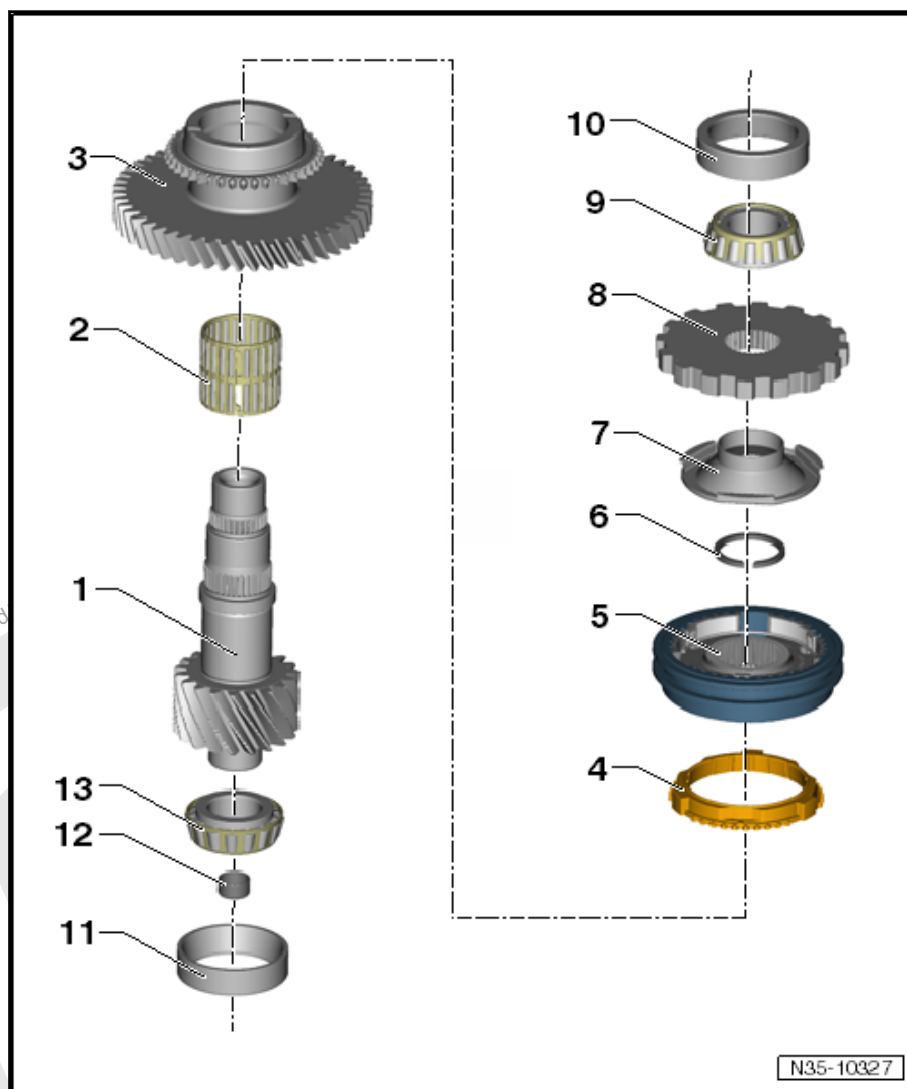
- The bearing shells may not be interchanged. They are paired with the bearing.

12 - Sleeve

- ❑ Does not have to be removed.
- ❑ Pry out using the screwdriver.
- ❑ Drive in all the way by hand using Locking Pin - T10043.

13 - Bearings

- ❑ Always replace the bearing from a shaft together.





2.2 Output Shaft 1, Disassembling and Assembling

⇒ [“2.2.1 Output Shaft 1, Partially Disassembling”, page 179](#)

⇒ [“2.2.2 Output Shaft 1, Completely Disassembling”, page 180](#)

⇒ [“2.2.3 Output Shaft 1, Assembling”, page 182](#)

⇒ [“2.2.4 Locking Collars and Synchronizer Hub for Output Shaft 1, Disassembling and Assembling”, page 188](#)

2.2.1 Output Shaft 1, Partially Disassembling

Special tools and workshop equipment required

- ◆ Socket - Xzn 14 - T10061-
- ◆ Press Plate - VW402-
- ◆ Removal Device - Component 2 - VW460/2-

The output shaft 1 only needs to be partially disassembled if the transmission must be adjusted.

If the transmission is cleaned or part of the shaft is replaced then completely disassemble the output shaft. Refer to ⇒ [“2.2.2 Output Shaft 1, Completely Disassembling”, page 180](#).

- Insert the protective jaws in the vise and tighten down on the output shaft.
- Loosen the bolt using -T10061- and remove.

After disassembly, always replace the bolt.

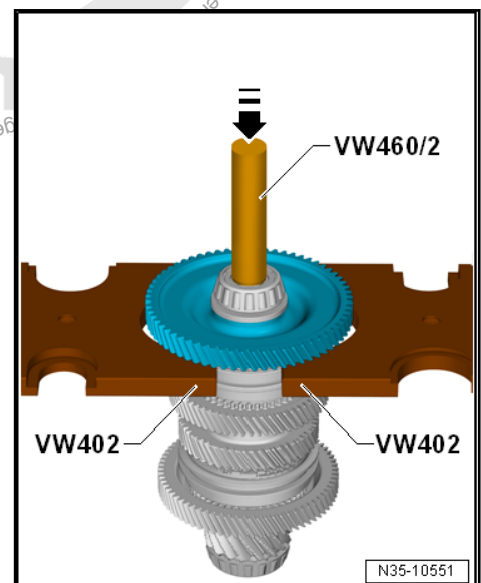
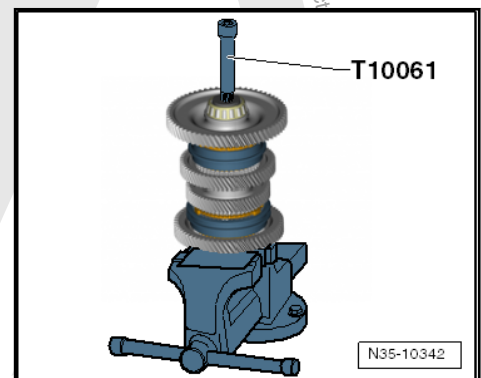


Note

So that the shaft does not fall downward when pressing in place suitable material under the press. It is also possible to hold the shaft by hand.

- Remove the 1st gear wheel from the output shaft.
- Remove the needle bearing.

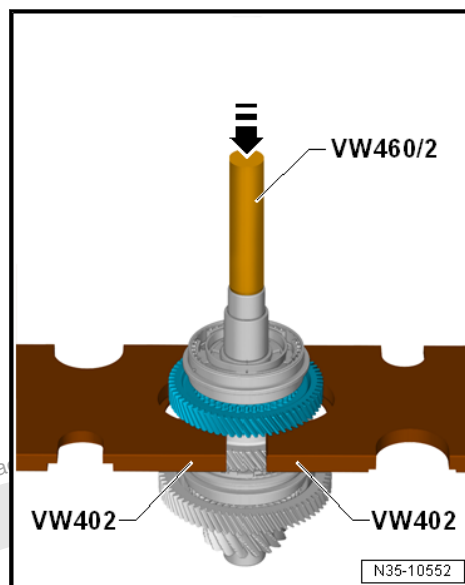
The needle bearing sleeve is removed in the next step.





- Remove the 3rd gear wheel with locking collar and synchronizer hub from the output shaft.

Assembling the output shaft 1. Refer to ⇒ [“2.2.3 Output Shaft 1, Assembling”, page 182](#).



2.2.2 Output Shaft 1, Completely Disassembling

Special tools and workshop equipment required

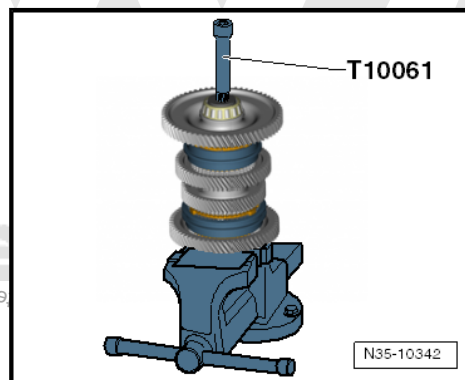
- ◆ Socket - Xzn 14 - T10061-
- ◆ Press Plate - VW402-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Removal Device - Component 2 - VW460/2-
- ◆ -3- Puller - VAS251413- (Kukko 17/3)
- ◆ -3- Splitter - VAS251405- (Kukko 15/3)
- Insert the protective jaws in the vise and tighten down on the output shaft.
- Loosen the bolt using -T10061- and remove.

After disassembly, always replace the bolt.



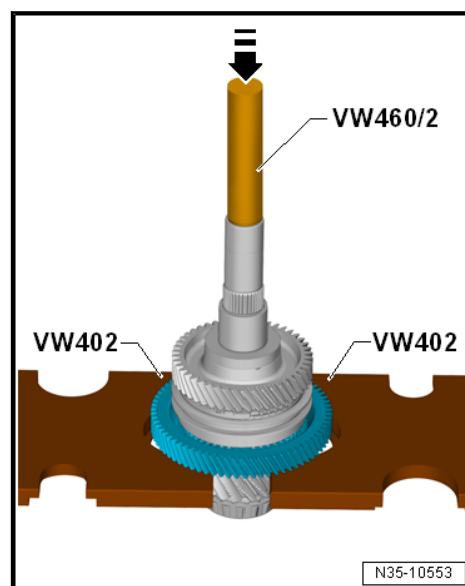
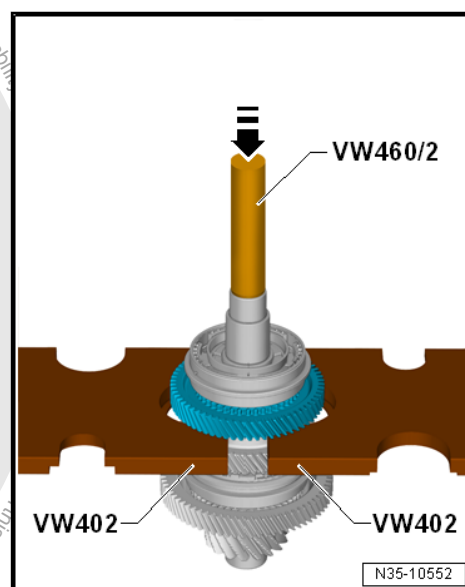
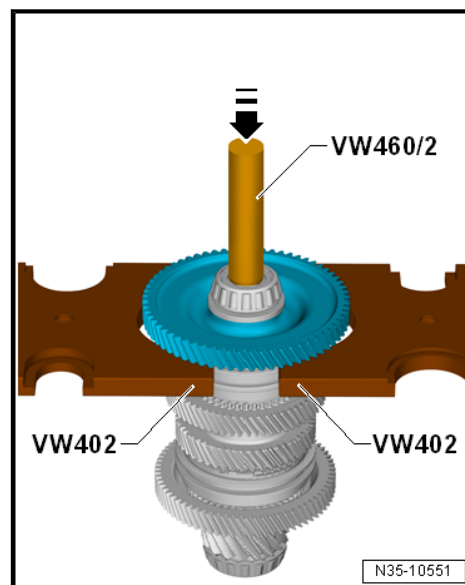
Note

So that the shaft does not fall downward when pressing in place suitable material under the press. It is also possible to hold the shaft by hand.





- Remove the 1st gear wheel from the output shaft.
 - Remove the needle bearing.
- The needle bearing sleeve is removed in the next step.



- Remove the 3rd gear wheel with locking collar and synchronizer hub from the output shaft.

- Completely press out the output shaft.



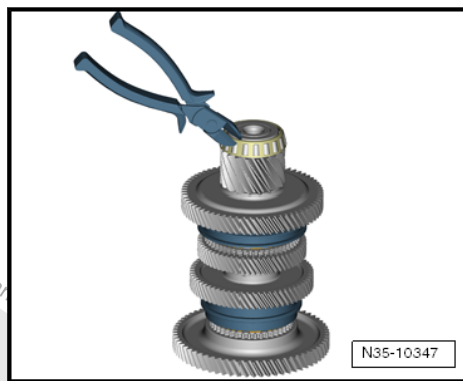
Note

Only perform the following step when the bearing is replaced.

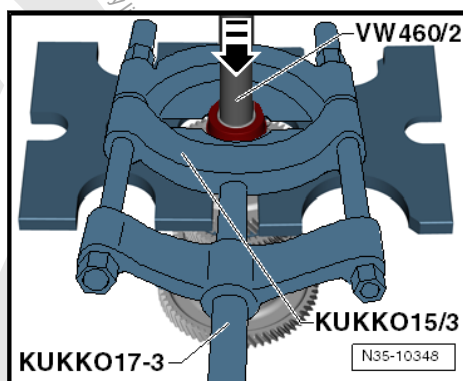


Removing the Output Shaft 1 Bearing

- First destroy the bearing cage.

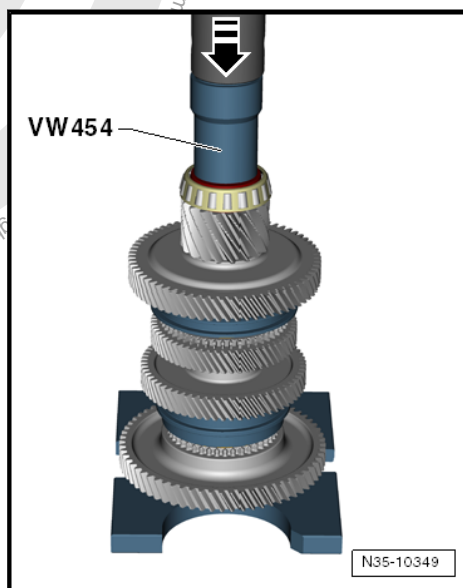


- Remove the bearing inner race.



Installing the Output Shaft 1 Bearing

Assembling the output shaft 1. Refer to ⇒ [“2.2.3 Output Shaft 1, Assembling”, page 182](#).



2.2.3 Output Shaft 1, Assembling

Special tools and workshop equipment required

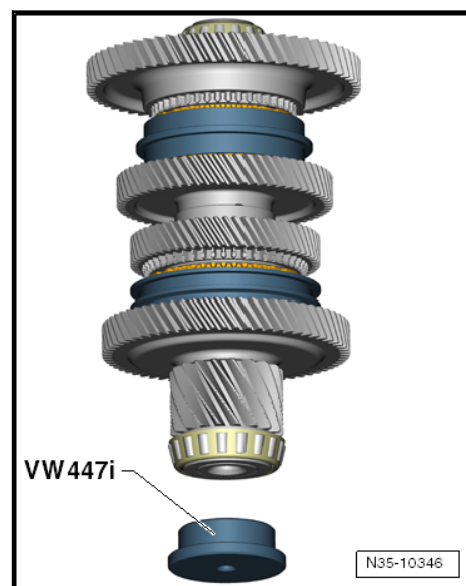
- ◆ Socket - Xzn 14 - T10061-
- ◆ Press Plate - VW402-
- ◆ Press Piece - 37mm - VW416B-
- ◆ Press Piece - Multiple Use - VW447i-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Multiple Use - VW455-



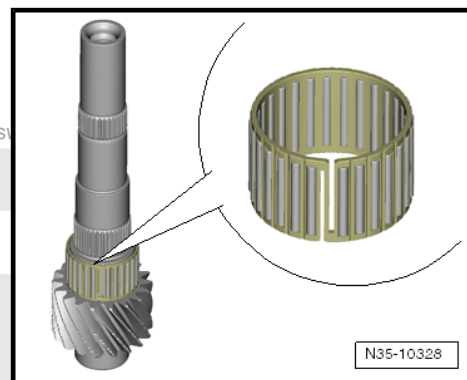
This procedure shows how the output shaft 1 is assembled. For the following procedures on the press the shaft bearing may not be damaged.

If the bearing is not replaced it must be protected.

- When installing the bearing for each pressing procedure the -VW447i- must also be used.
- Removing the bearing. Refer to [⇒ page 182](#).
- Installing the bearing. Refer to [⇒ page 182](#).

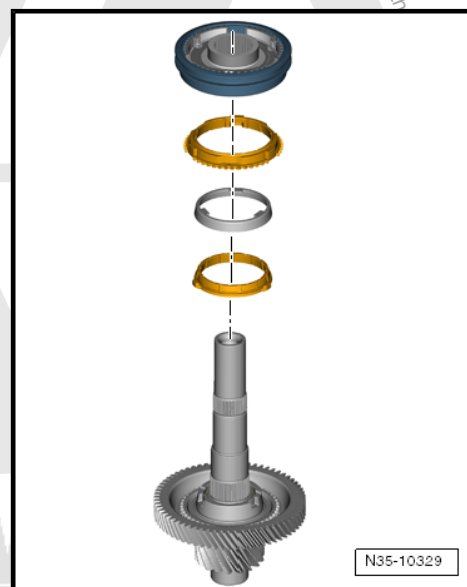


- Place the needle bearing on the output shaft.
- Pay attention that the cage is not broken.
- Coat the bearing with oil.



- Place the gear wheel for the 2nd gear on the needle cage.
- Coat the friction surface with oil.
- Place both synchronizer rings with the outer race on the 2nd gear wheel.
- Position the locking collar on the synchronizer hub. At the same time the groove for the shift fork points »upward«, the collar of the shift fork »downward«.

The synchronizer hub can only be positioned. It is installed in the next step.



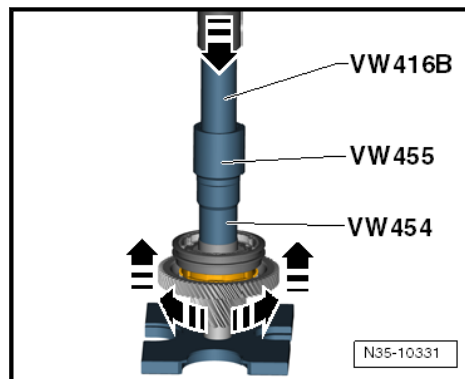


- Install the synchronizer hub.



Note

- ◆ While pressing on, pay attention to two things:
- ◆ Lift the gear and at the same time do not turn. The synchronizer ring is in its installation position, before the synchronizer hub clamps the ring.
- ◆ After the ring has found its seat press on only until more force is felt. Then immediately stop pressing. The gear wheel for the 2nd gear must have axial play. The wheel has its installation position as soon as the force is increased while pressing. If pressed in further the synchronizer hub is pressed against the needle bearing and damaged.



After pressing turn the gear wheel in the horizontal position of the shaft »free«.

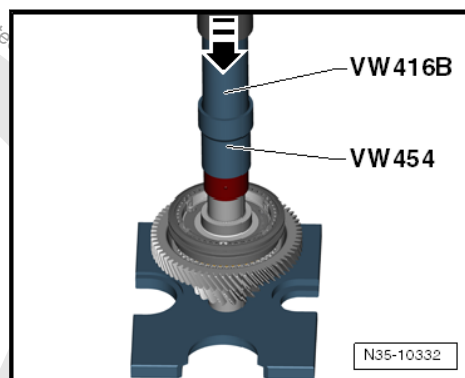
- Install the needle bearing sleeve from the 4th gear wheel.

Installation direction: lettering faces »downward«.

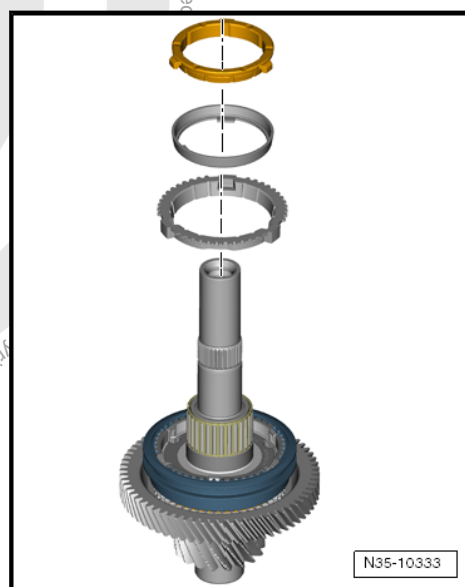


Note

Also immediately stop pressing here, when an increase in force can be felt when pressing in. Do not press in again.

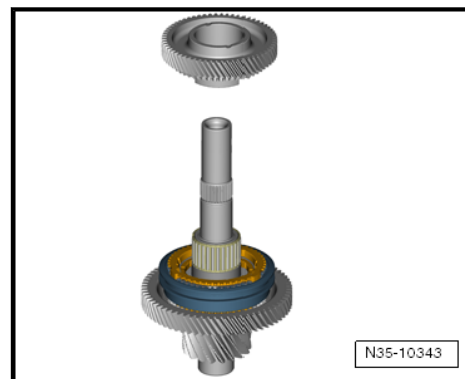


- Install the needle bearing.
- Coat the bearing with oil.
- Coat the friction surface with oil.
- Position the large synchronizer ring, outer race and small synchronizer ring.





- Position the 4th gear wheel.

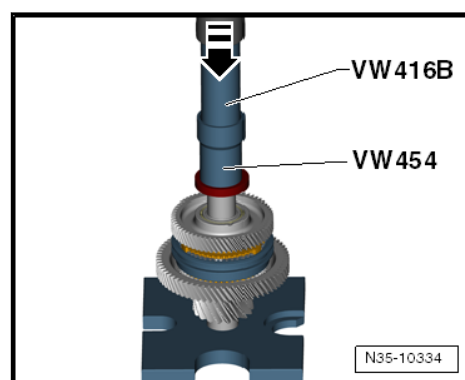


- Install the washer.



Note

- ◆ Also immediately stop pressing here, when an increase in force can be felt when pressing in. Do not press in again.
- ◆ After pressing turn the gear wheel in the horizontal position of the shaft »free«.
- ◆ To press in the output shaft the shaft is assembled up to this washer.



WARNING

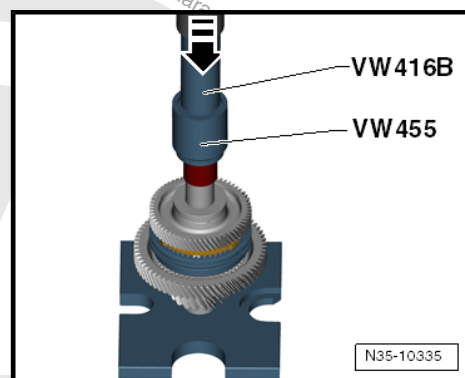
First assemble the output shaft when the transmission is adjusted. Refer to ⇒ "2.5 Output Shaft, Adjusting", page 199.

- Install the needle bearing sleeve from the 3rd gear wheel.



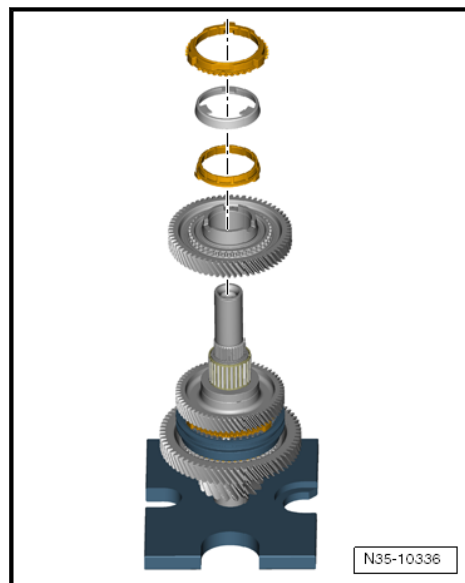
Note

Also immediately stop pressing here, when an increase in force can be felt when pressing in. Do not press in again.





- Install the needle bearing.
- Coat the bearing and friction surfaces with oil.
- Position the 3rd gear wheel, small synchronizer ring, outer race and large synchronizer ring.



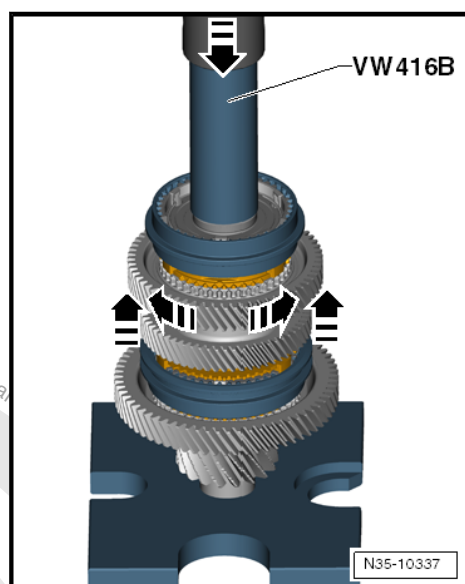
- Install the locking collar and synchronizer hub.



Note

- ◆ While pressing on, pay attention to two things:
- ◆ Lift the gear and at the same time do not turn. The synchronizer ring is in its installation position, before the synchronizer hub clamps the ring.
- ◆ After the ring has found its seat press on only until more force is felt. Then immediately stop pressing. The 3rd gear wheel must have axial play. The wheel has its installation position as soon as the force is increased while pressing. If pressed in further the synchronizer hub is pressed against the needle bearing and damaged.

After pressing turn the gear wheel in the horizontal position of the shaft »free«

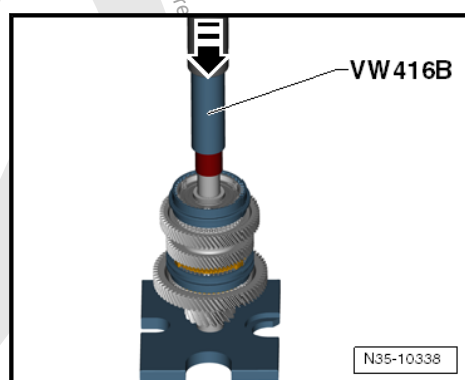


- Install the needle bearing sleeve from the 1st gear wheel.



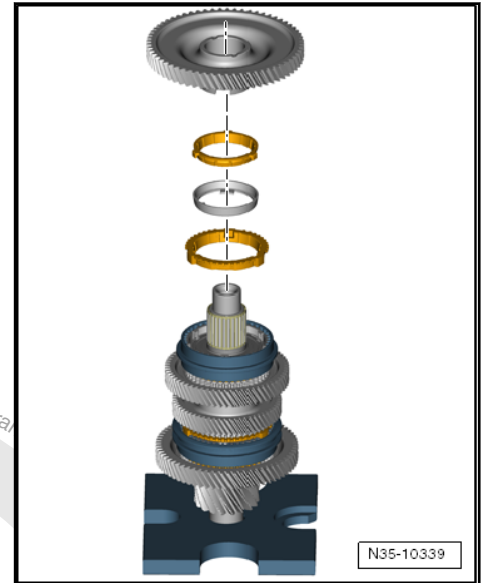
Note

Also immediately stop pressing here, when an increase in force can be felt when pressing in. Do not press in again.





- Install the needle bearing.
 - Coat the bearing and friction surfaces with oil.
 - Then place the small synchronizer ring on the 1st gear wheel.
 - Then the outer race and then the large synchronizer ring.
- The gear and shaft can be installed together on the shaft.



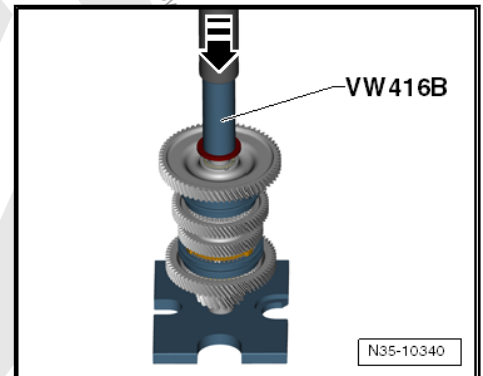
- Install the washer.



Note

Also immediately stop pressing here, when an increase in force can be felt when pressing in. Do not press in again.

After pressing turn the gear wheel in the horizontal position of the shaft »free«.



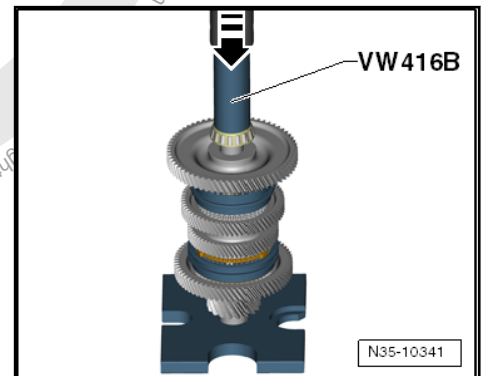
- Install the bearing.



Note

Also immediately stop pressing here, when an increase in force can be felt when pressing in. Do not press in again.

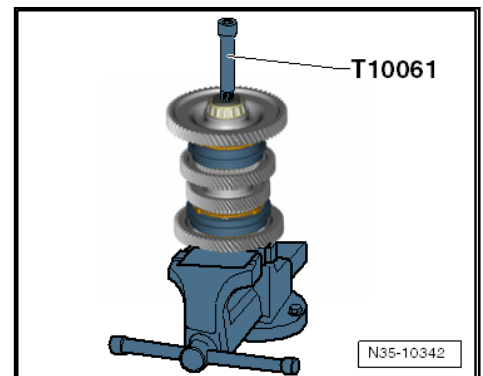
- Coat the bearing with oil.



- Install new bolt and tighten.

Tightening Specifications

- ◆ Refer to ➔ [“2.1.1 Overview - Output Shaft 1”, page 173](#)





2.2.4 Locking Collars and Synchronizer Hub for Output Shaft 1, Disassembling and Assembling



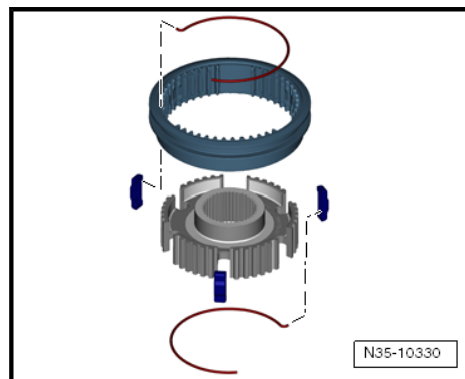
Note

Before disassembling mark the installation position and direction of all components to each other.

2nd and 4th gear locking collar and synchronizer hub, disassembling and assembling

The lettered side of the synchronizer hub points to the groove in the locking collar.

The locking collar from the 3rd and 1st gear is assembled accordingly. It is systematic, it does not have a specific installation direction.



2.3 Output Shaft 2, Disassembling and Assembling

⇒ [“2.3.1 Output Shaft 2, Disassembling”, page 188](#)

⇒ [“2.3.2 Output Shaft 2, Assembling”, page 190](#)

⇒ [“2.3.3 Locking Collars and Synchronizer Hub for Output Shaft 2, Disassembling and Assembling”, page 195](#)

2.3.1 Output Shaft 2, Disassembling

Special tools and workshop equipment required

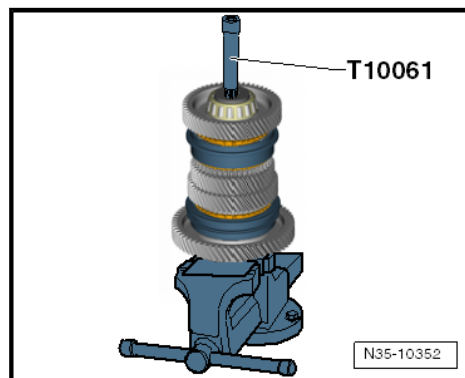
- ◆ Socket - Xzn 14 - T10061-
- ◆ Press Plate - VW402-
- ◆ Press Piece - 37mm - VW416B-
- ◆ Press Piece - Multiple Use - VW447H-
- ◆ Removal Device - Component 2 - VW460/2-
- ◆ 3- Puller - VAS251413- (Kukko 17/3)
- ◆ 3- Splitter - VAS251405- (Kukko 15/3)
- Insert the protective jaws in the vise and tighten down on the output shaft.
- Loosen the bolt using -T10061- and remove.

After disassembly, always replace the bolt.



Note

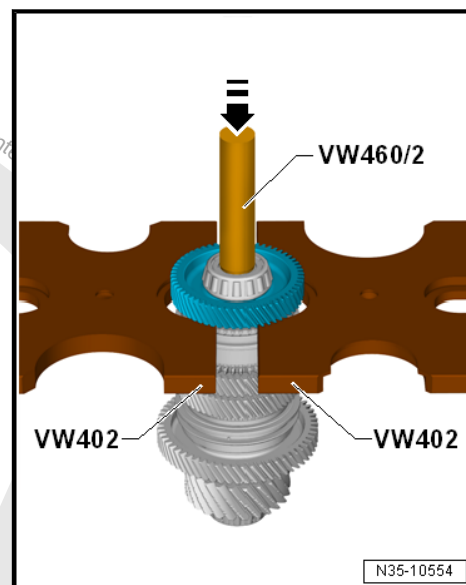
So that the shaft does not fall downward when pressing in place suitable material under the press. It is also possible to hold the shaft by hand.





- Remove the 5th gear wheel from the output shaft.
- Remove the needle bearing.

The needle bearing sleeve is removed in the next step.

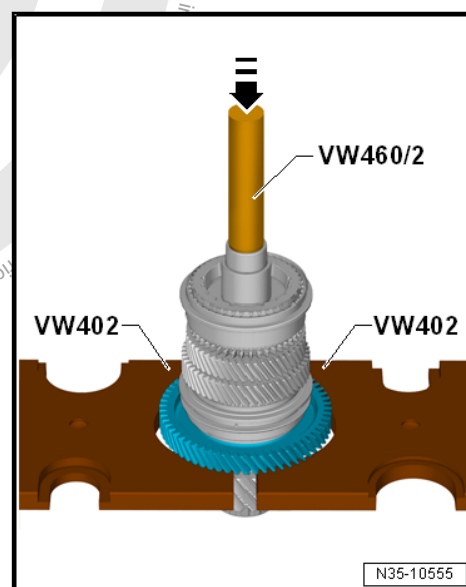


- Completely press out the output shaft.



Note

Only perform the following step when the bearing is replaced.



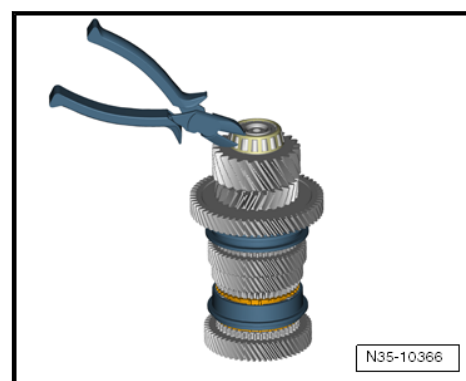
Removing the Output Shaft 2 Bearing

- First destroy the bearing cage.



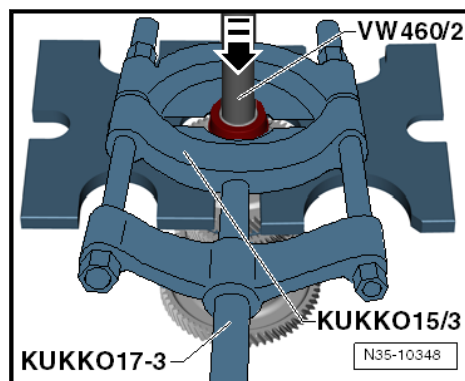
Note

So that the shaft does not fall downward when pressing in place suitable material under the press. It is also possible to hold the shaft by hand.



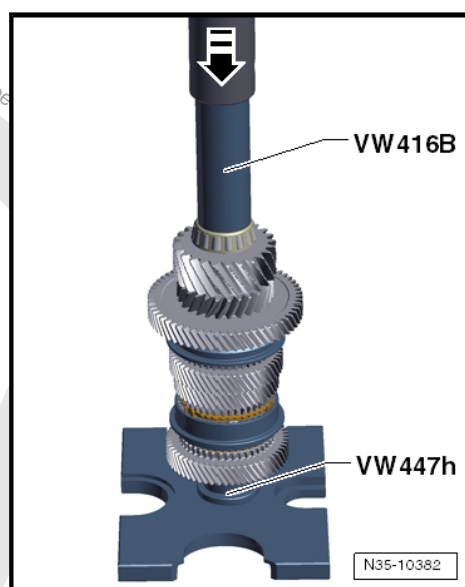


- Remove the bearing inner race.



Installing the Output Shaft 2 Bearing

- Assembling the output shaft 2. Refer to ⇒ [“2.3.2 Output Shaft 2, Assembling”, page 190](#).



2.3.2 Output Shaft 2, Assembling

Special tools and workshop equipment required

- ◆ Socket - Xzn 14 - T10061-
- ◆ Press Plate - VW402-
- ◆ Press Piece - 37mm - VW416B-
- ◆ Press Piece - Multiple Use - VW447H-
- ◆ Press Piece - Multiple Use - VW454-
- ◆ Press Piece - Multiple Use - VW455-

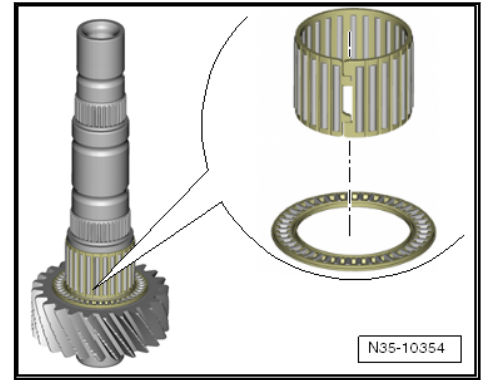
This procedure shows how the output shaft 2 is assembled. For the following procedures on the press the shaft bearing may not be damaged.

If the bearing is not replaced it must be protected.

- When installing the bearing for each pressing procedure the -VW447H- must also be used.
- Removing the bearing. Refer to ⇒ [page 189](#).
- Installing the bearing. Refer to ⇒ [page 190](#).



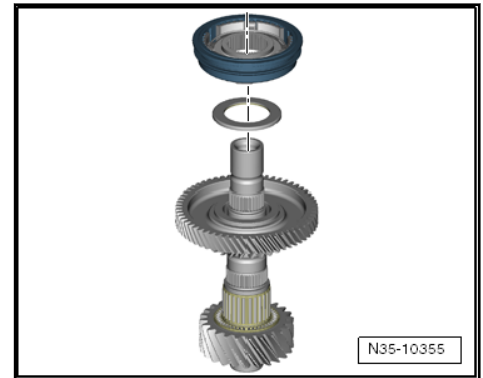
- Place the both needle bearings on the output shaft.
- Pay attention that the cage is not damaged.
- Coat the bearing with oil.
- Position the reverse drive gear.



- Position the reverse drive gear, axial bearing »with the flat side facing upward«.
- Position the locking collar on the synchronizer hub. At the same time the surrounding sleeve edge points »upward« and the collar of the locking collar »downward«.

Disassembling and assembling the locking collar. Refer to [2.3.3 Locking Collars and Synchronizer Hub for Output Shaft 2, Disassembling and Assembling](#), page 195 .

The synchronizer hub can only be positioned. It is installed in the next step.

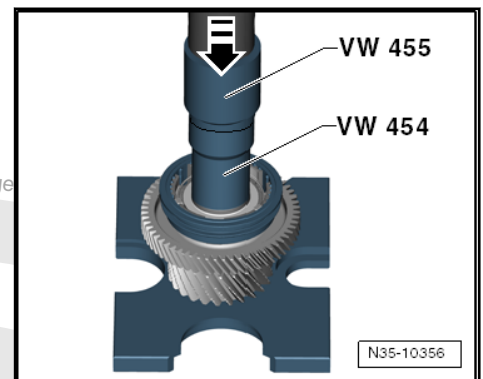


- Install the synchronizer hub.

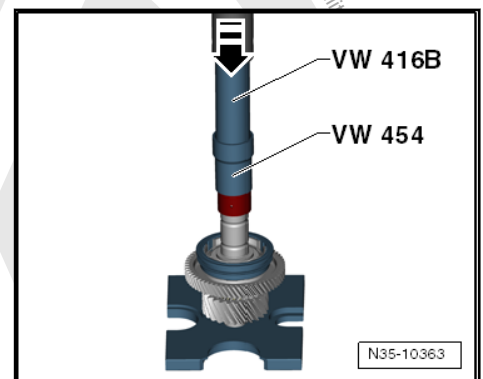


Note

Immediately stop pressing when an increase in force can be felt when pressing in. Do not press in again.

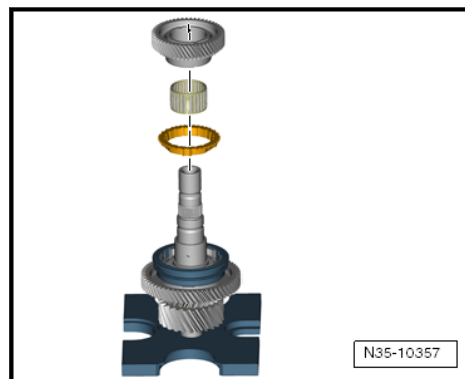


- Press on the sleeve for the 6th gear wheel.





- Position the synchronizer ring, needle bearing and 6th gear wheel.
- Coat the bearing and friction surfaces with oil.



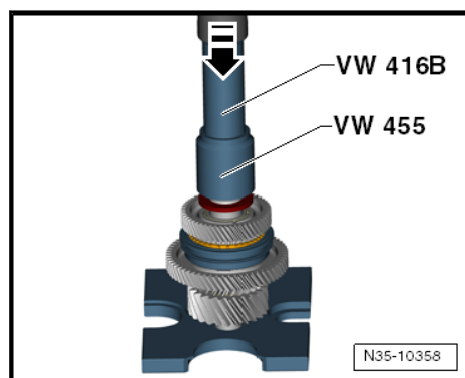
- Press on the washer for the 6th gear wheel.

If there is lettering on the washer, then position this side »downward«.



Note

- ◆ Also immediately stop pressing here, when an increase in force can be felt when pressing in. Do not press in again.
- ◆ After pressing turn the gear wheel in the horizontal position of the shaft »free«.
- ◆ To press in the output shaft the shaft is assembled up to this washer.



WARNING

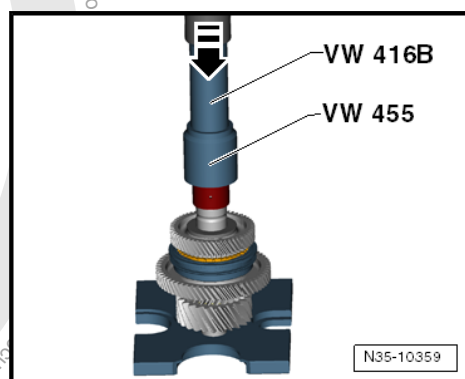
First assemble the output shaft when the transmission is adjusted. Refer to ⇒ "2.5 Output Shaft, Adjusting", page 199.

- Install the needle bearing sleeve from the 7th gear wheel.



Note

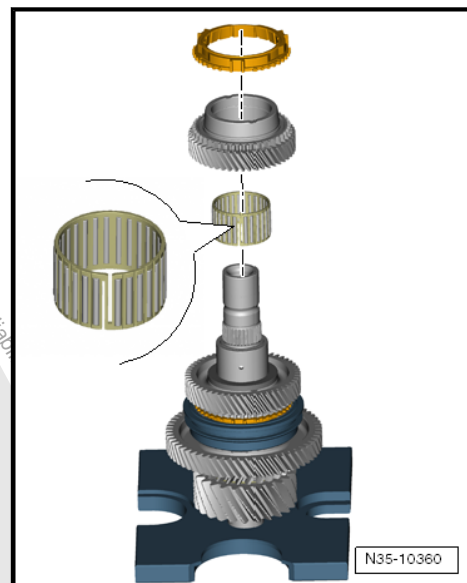
Also immediately stop pressing here, when an increase in force can be felt when pressing in. Do not press in again.





- Position the needle bearing, 7th gear wheel and synchronizer ring.
- Coat the bearing and friction surface with oil.
- Position the locking collar on the synchronizer hub. At the same time the surrounding sleeve edge points »upward« and the collar of the locking collar »downward«.

The synchronizer hub can only be positioned. It is installed in the next step.

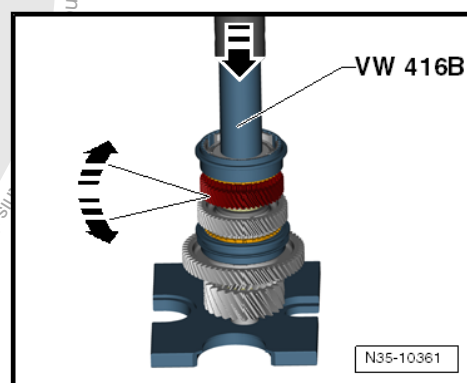


Install the synchronizer hub.



Note

- ◆ While pressing on, pay attention to two things:
- ◆ Lift the gear and at the same time do not turn. The synchronizer ring is in its installation position, before the synchronizer hub clamps the ring.
- ◆ After the ring has found its seat press on only until more force is felt. Then immediately stop pressing. The 3rd gear wheel must have axial play. The wheel has its installation position as soon as the force is increased while pressing. If pressed in further the synchronizer hub is pressed against the needle bearing and damaged.
- ◆ After pressing turn the gear wheel in the horizontal position of the shaft »free«.

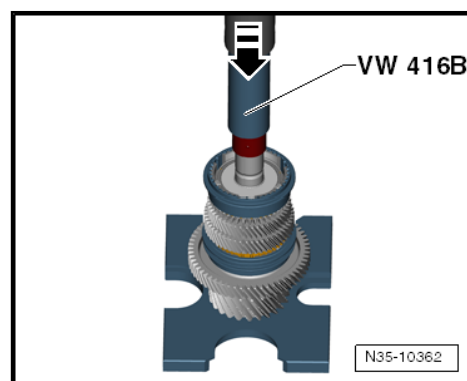


- Install the needle bearing sleeve from the 5th gear wheel.



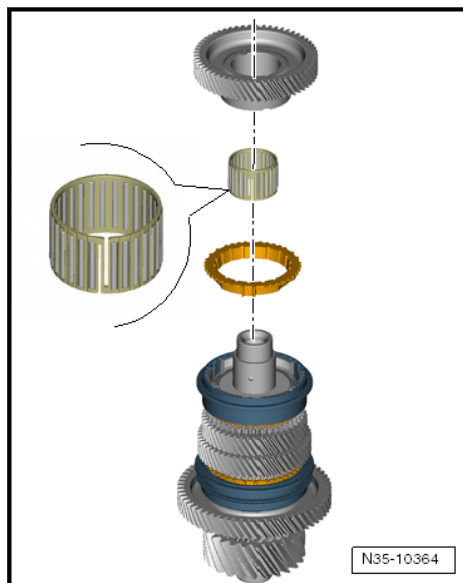
Note

Also immediately stop pressing here, when an increase in force can be felt when pressing in. Do not press in again.

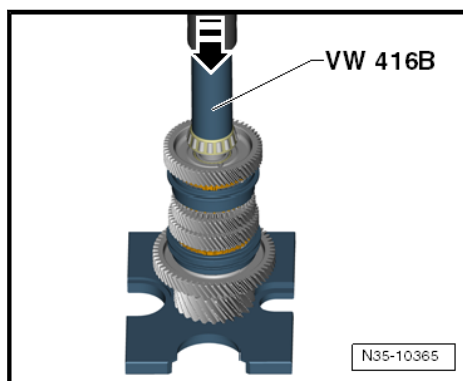




- Position the synchronizer ring, needle bearing and 5th gear wheel.
- Coat the bearing and friction surface with oil.



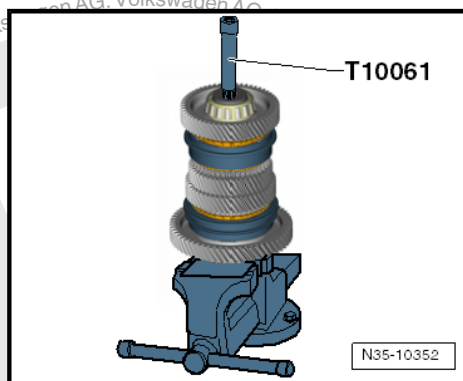
- Install the bearing.
- Coat the bearing with oil.



- Install new bolt and tighten.

Tightening Specifications

- ◆ Refer to ⇒ [“2.1.2 Overview - Output Shaft 2”, page 175](#)





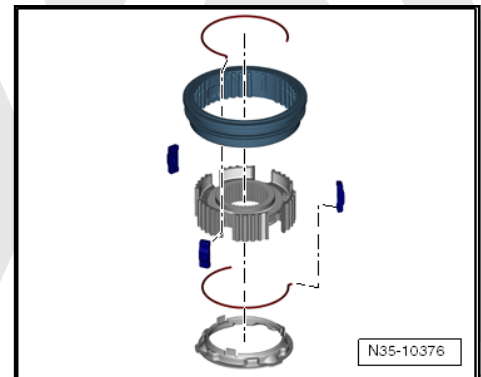
2.3.3 Locking Collars and Synchronizer Hub for Output Shaft 2, Disassembling and Assembling



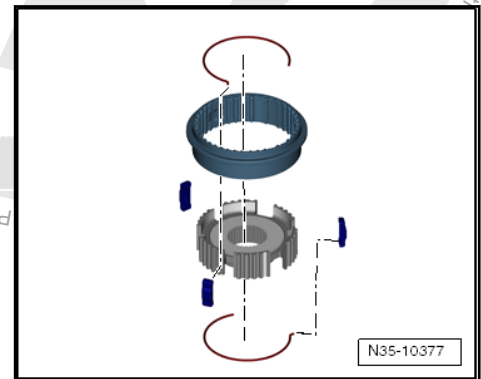
Note

Before disassembling mark the installation position and direction of all components to each other.

Locking collar and synchronizer hub for the 6th gear wheel.



Locking collar and synchronizer hub for the 7th and 5th gear wheel.



2.4 Output Shaft 3, Disassembling and Assembling

⇒ ["2.4.1 Output Shaft 3, Disassembling", page 195](#)

⇒ ["2.4.2 Output Shaft 3, Assembling", page 197](#)

⇒ ["2.4.3 Locking Collar and Synchronizer Hub for Output Shaft 3, Disassembling and Assembling", page 199](#)

2.4.1 Output Shaft 3, Disassembling

Special tools and workshop equipment required

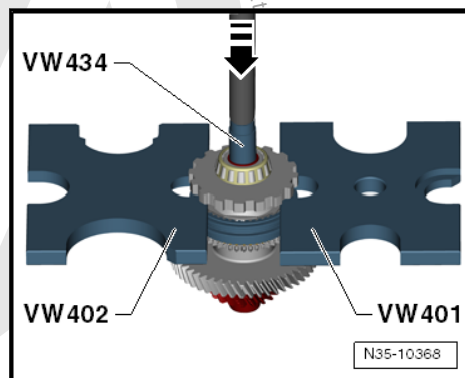
- ◆ Press Plate - VW402-
- ◆ Press Plate - VW401-
- ◆ Press Piece - 37mm - VW416B-
- ◆ Press Piece - Bushing - VW434-
- ◆ Press Piece - Multiple Use - VW447H-
- ◆ Removal Device - Component 2 - VW460/2-
- ◆ -3- Puller - VAS251413- (Kukko 17/3)
- ◆ -3- Splitter - VAS251405- (Kukko 15/3)



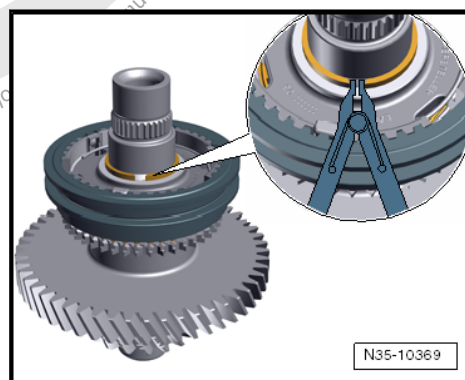
Note

So that the shaft does not fall downward when pressing in place suitable material under the press. It is also possible to hold the shaft by hand.

- Remove the parking lock gear together with the bearing.



- Remove the locking ring.

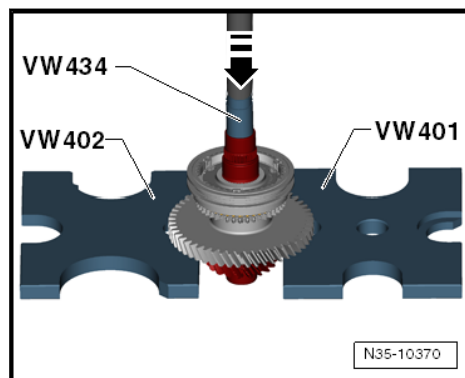


- Remove the shaft.



Note

Only perform the following step when the bearing is replaced.



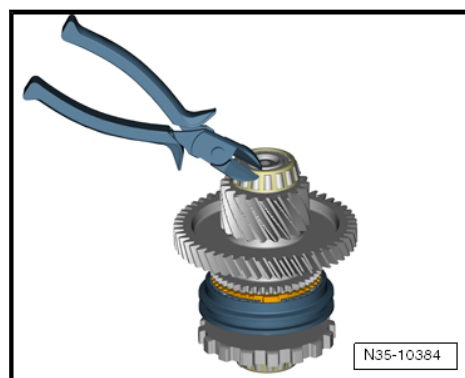
Removing the Output Shaft 3 Bearing

- First destroy the bearing cage.



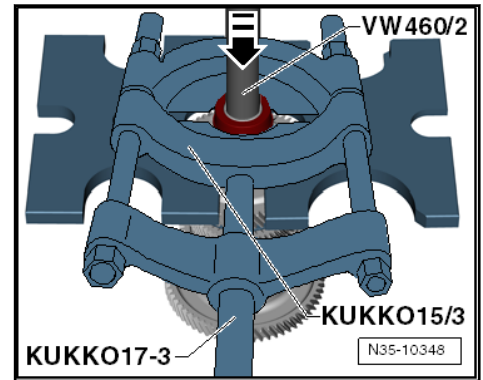
Note

So that the shaft does not fall downward when pressing in place suitable material under the press. It is also possible to hold the shaft by hand.



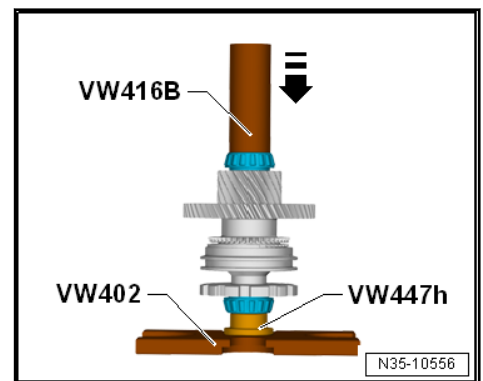


- Remove the bearing inner race.



Installing the Output Shaft 3 Bearing

- Assembling the output shaft 3. Refer to ⇒ [“2.4.2 Output Shaft 3, Assembling”](#), page 197 .



2.4.2 Output Shaft 3, Assembling

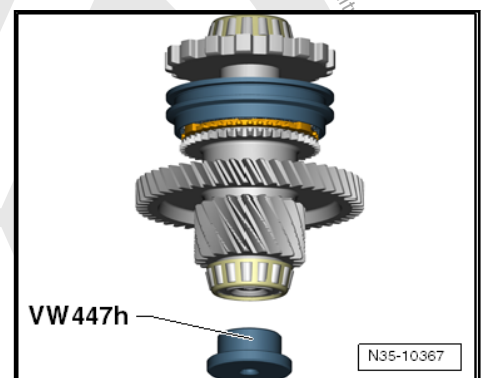
Special tools and workshop equipment required

- ◆ Press Plate - VW402-
- ◆ Press Piece - 37mm - VW416B-
- ◆ Press Piece - Multiple Use - VW447H-
- ◆ Press Piece - Multiple Use - VW454-

This procedure shows how the output shaft 3 is assembled. For the following procedures on the press the shaft bearing may not be damaged.

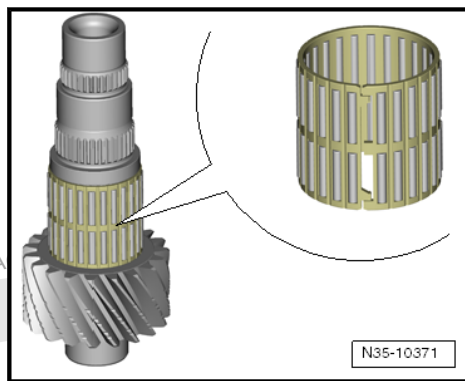
If the bearing is not replaced it must be protected.

- When installing the bearing for each pressing procedure the -VW447H- must also be used.
- Removing the bearing. Refer to ⇒ [page 196](#) .
- Installing the bearing. Refer to ⇒ [page 197](#) .



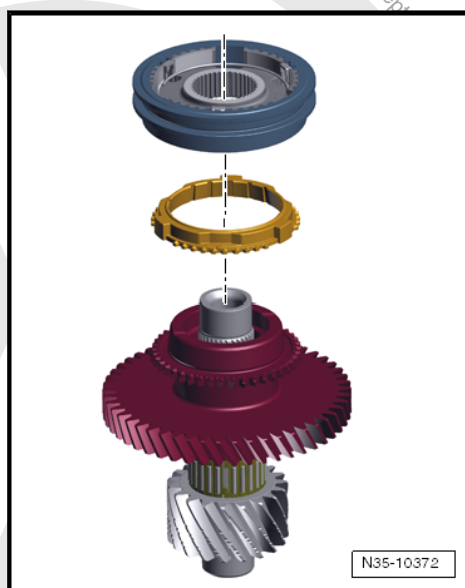


- Install the needle bearing.
- Coat the bearing lightly with oil.



- Position the reverse gear, gear wheel, synchronizer ring and locking collar.
- Coat the friction surface with oil.

The synchronizer hub can only be positioned. It is installed in the next step.

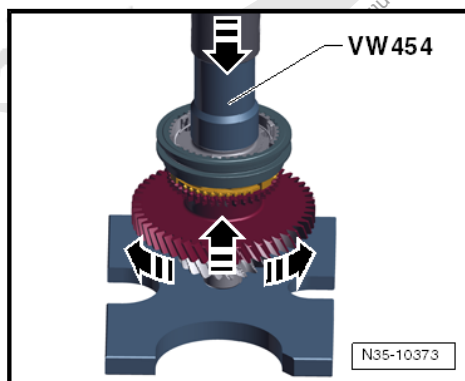


- Press on the synchronizer hub and locking collar.



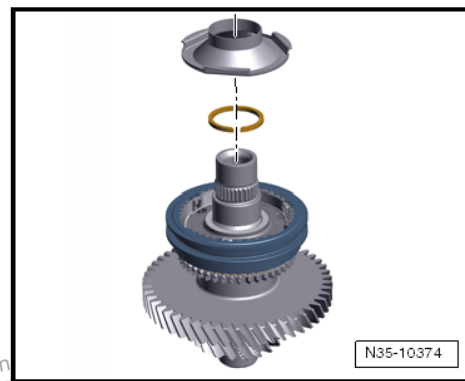
Note

- ◆ While pressing on, pay attention to two things:
- ◆ Lift the gear and at the same time do not turn. The synchronizer ring is in its installation position, before the synchronizer hub clamps the ring.
- ◆ After the ring has found its seat press on only until more force is felt. Then immediately stop pressing.
- ◆ After pressing turn the gear wheel in the horizontal position of the shaft »free«.

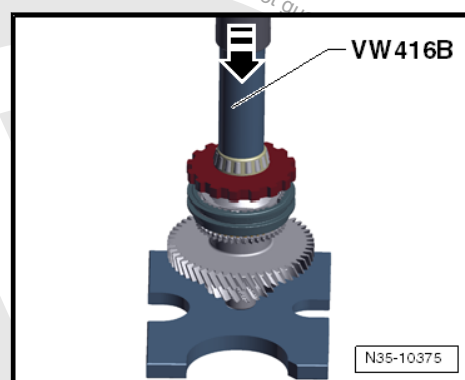




- Insert the circlip.
- Insert the -stop ring-.



- Position the parking lock gear and bearing.
- Press on both together.



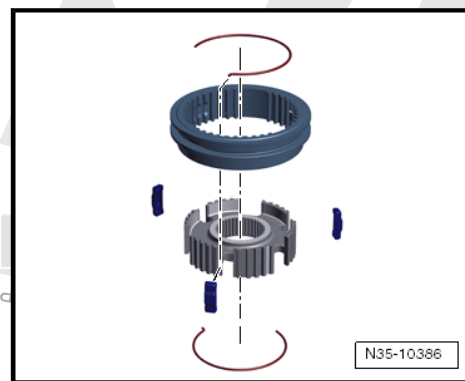
2.4.3 Locking Collar and Synchronizer Hub for Output Shaft 3, Disassembling and Assembling



Note

Before disassembling mark the installation position and direction of all components to each other.

Locking Collar and Synchronizer Hub for Output Shaft 3, Disassembling and Assembling



2.5 Output Shaft, Adjusting

⇒ [“2.5.1 Notes for Adjusting the Transmission”, page 199](#)

⇒ [“2.5.2 Clutch Housing Shim, Determining”, page 201](#)

⇒ [“2.5.3 Transmission Housing Shims, Determining”, page 213](#)

2.5.1 Notes for Adjusting the Transmission

The adjustment is divided into two »parts«:

**A - Here the Shims are Determined, that will be Inserted in the Clutch Housing.**

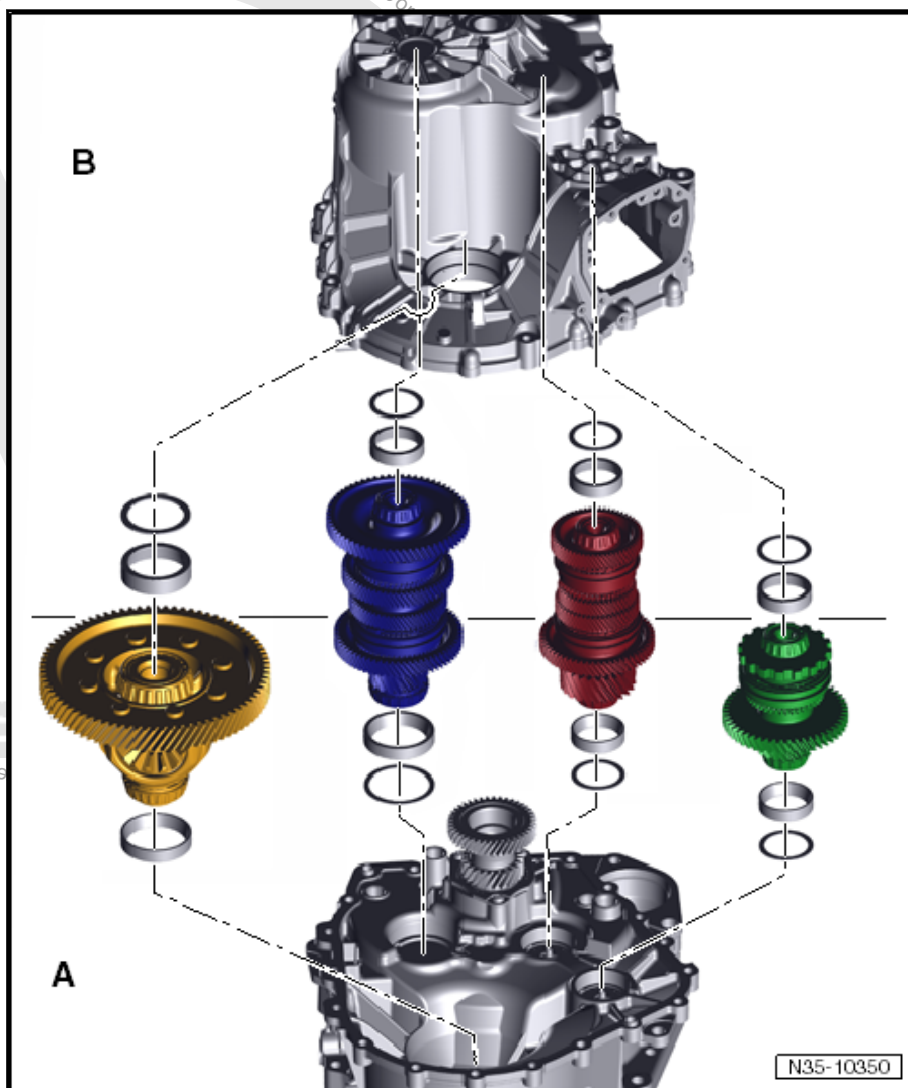
- It begins with these procedures. The goal is that the output shafts 1 to 3 in align in the clutch housing in the »intended level«. This »intended level« is specified from the front end of the outer driveshaft. Refer to ⇒ ["2.5.2 Clutch Housing Shim, Determining"](#), [page 201](#) for how this is done.

A bearing race is placed under the differential bearing shell, which is not shown here but is installed together with the bearing shell.

B - The »thickness« of this Shim is Determined by the Assembly of the Transmission, by Which Force the Shafts are »tensioned« between the Two Halves. These Shims are Inserted in the Transmission Housing.

- Refer to ⇒ ["2.5.3 Transmission Housing Shims, Determining"](#), [page 213](#) for how this is done.

- The shims -B- can only be determined when the shims in the clutch housing -A- are correctly determined or do not have to be measured.
- Only determine the shims -B- when the shims -A- are OK.



- Work with intact tools and pay attention to cleanliness.
- Prevent difference in temperature between the transmission and the socket wrench.
- The sealing surfaces on both transmission housing halves should be flat and not »destroyed or damaged«.
- Only position the measuring table when the guide bushing is present in the housing.
- Do not interchange the bearing shells of the same size, always install the bearing from the shaft together.
- Follow this procedure step by step. Difference in temperature, for example »summer and winter« affect all measuring tools.
- In the following calculations the number values are given in millimeters. These numbers are always marked as an -example-.
- Notes made during the measurement should be readable and comprehensible. Paper coated in oil is not good for this.



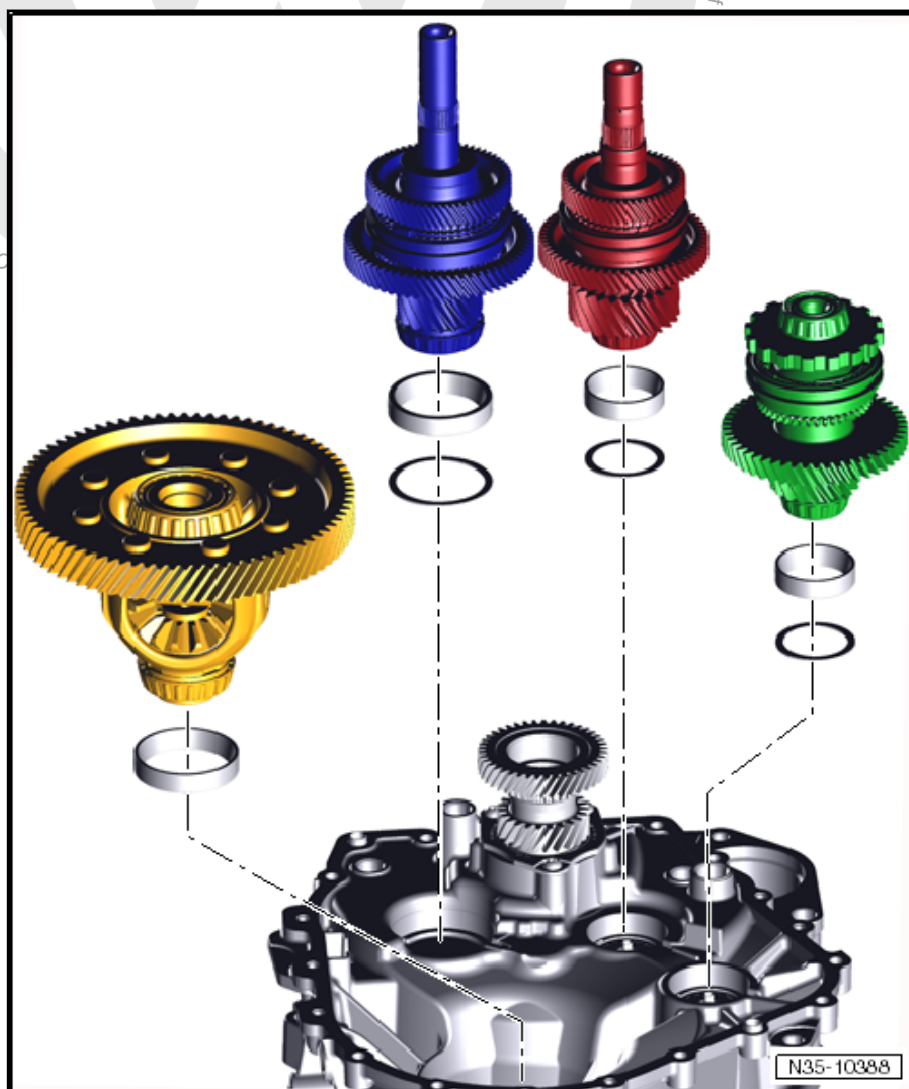
2.5.2 Clutch Housing Shim, Determining

Special tools and workshop equipment required

- ◆ Measuring Tool - T10425-
- ◆ Dial Gauge - 0-10mm - VAS6079-
- ◆ Dial Gauge Holder - VW387-
- ◆ Not illustrated: Digital Depth Gauge w/Measuring Hook - 200mm - VAS6619-
- ◆ Digital Depth Gauge - 300mm - VAS6594-

Brief Description:

In this »step« it is determined, how thick the shim in the clutch housing must be. There are three shims installed in total. Under each output shaft one shim. The differential does not have a shim.



It begins with these procedures. The goal is that the output shafts 1 to 3 in align in the clutch housing in the »intended level«. This »intended level« is specified from the front end of the outer driveshaft.



There are guide plates under the output shaft 2 and 3 which are not shown here. Refer to ⇒ [“7.4 Clutch Housing, Servicing”, page 148](#) for the installation of shims, guide plates and bearing shells.

A bearing race is placed under the differential bearing shell, which is not shown here but is installed together with the bearing shell.



Note

To determine the shims do not install guide plates or shims. Only install the shaft bearing shells.

Requirement:

- The clutch housing sealing surface is clean, level and not »destroyed or damaged«.
- The outer driveshaft is installed. Refer to ⇒ [“7.4 Clutch Housing, Servicing”, page 148](#).
- The bearing shells of all shafts and the differential bearing shells are installed. Refer to ⇒ [“7.4 Clutch Housing, Servicing”, page 148](#).
- No guide plates and no shims are installed.



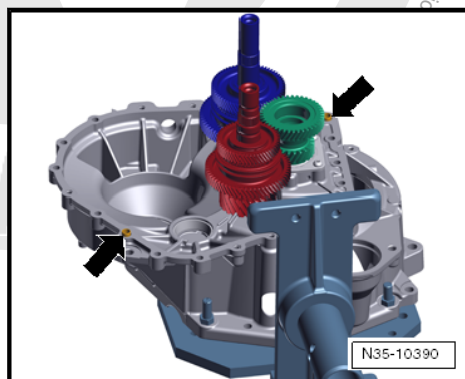
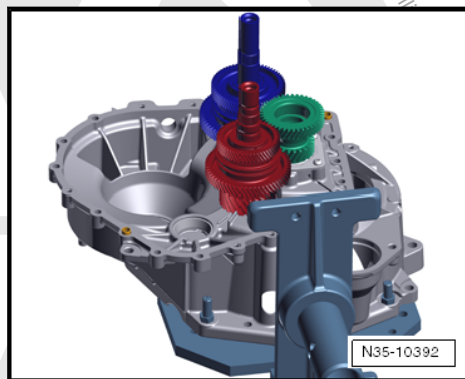
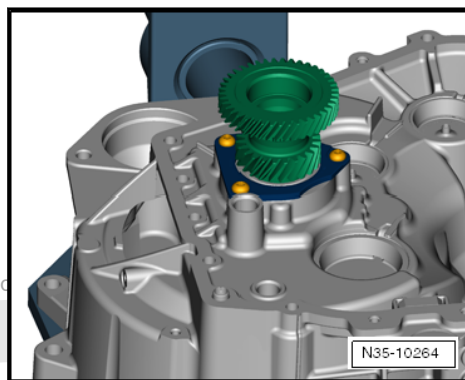
Note

Only for adjustment: do not install shims. Do not install guide plates.

- Place the partially disassembled output shaft 1 and output shaft 2 in the bearing shell.

How »far« the shafts can be assembled: output shaft 1 refer to ⇒ [“2.2.1 Output Shaft 1, Partially Disassembling”, page 179](#) and output shaft 2 refer to ⇒ [“2.3.2 Output Shaft 2, Assembling”, page 190](#).

- Pay attention that the alignment sleeves are inserted in the clutch housing.

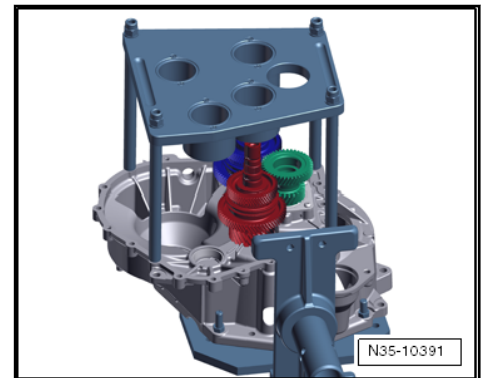
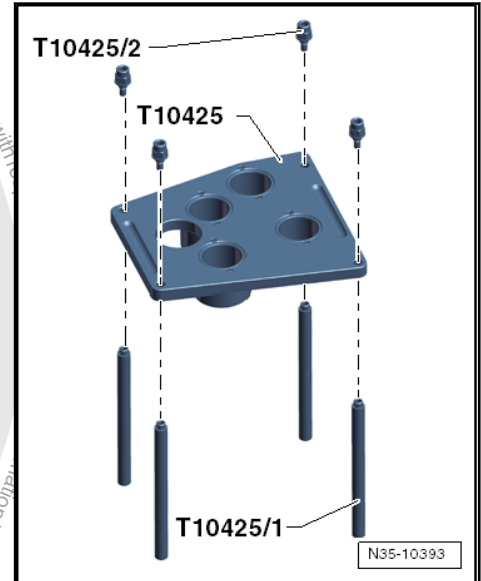




Assemble the -T10425- for the procedures on the clutch housing.

Tightening Specification: 15 Nm

- Place the -T10425- on the alignment sleeves.



- Place the -T10425/3- on the output shaft 1.



Note

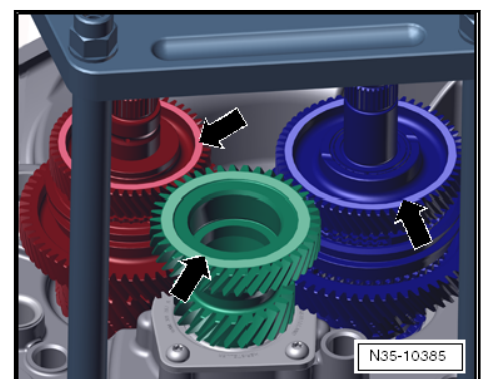
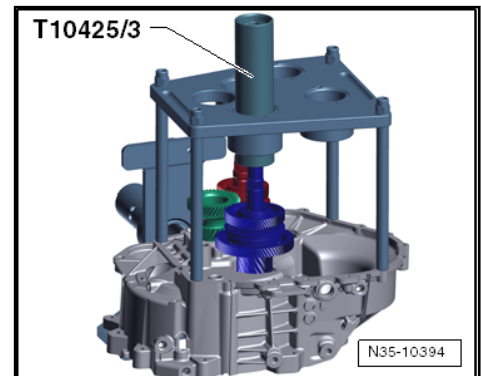
All gears have burrs on the gears. These burrs »interfere« with measuring. Here it is shown -where- the gears are measured in the following measurement.

The measuring surfaces begin on the »feet« of the teeth.

They extend up to the »first shoulder«. Illustrated "light" in the image.

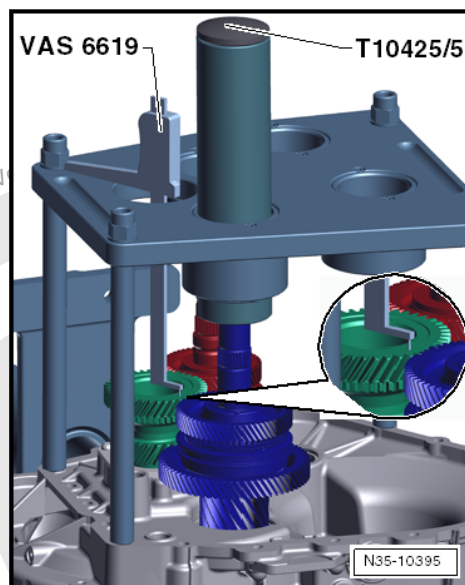
The teeth themselves can be used to measure. It is important that the depth gauge is not placed on the burr.

It begins with the output shaft 1

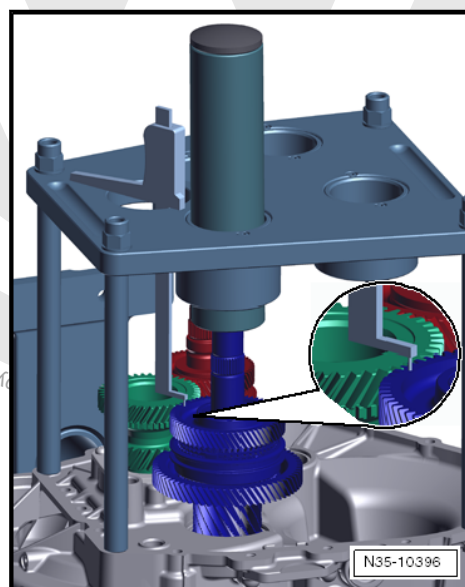




- Place the -VAS6619- on the outer driveshaft. Here shown as »green«. Set the sliding gauge to »zero«.



- Measure on the 4th gear wheel of the output shaft 1 using the -VAS6619-. Here shown as »blue«.
- Note this value.
- Name this value "A1_a".





- It is measured three times. Name the additional values “A1_b” and “A1_c”.
- Before the additional turn mark the driveshaft.
- Turn the driveshaft 120° in the direction of -arrow- and measure again. The turn 120° additional turn again and measure again.



Note

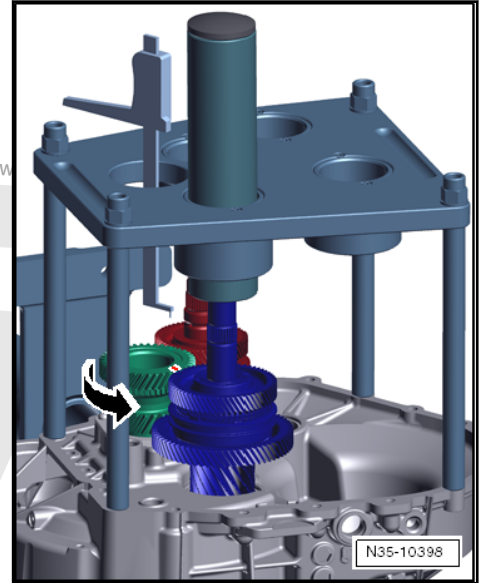
The shaft wheels are toothed at an angle. When turning the shafts it can be the case that they are lifted from the bearing.

- So that the shafts stay in the bearing, while turning push forcefully by hand on the -T10425/3- . Do not forget the -T10425/5- .

Determine the average from the three measured values “A1_a”, “A1_b” and “A1_c”.

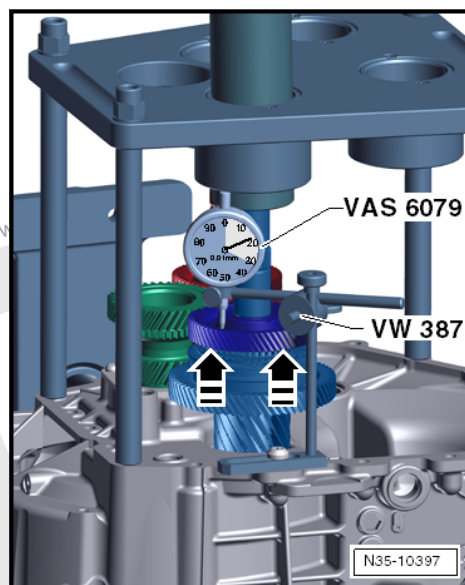
$$\text{Formula: } A1_a + A1_b + A1_c : 3 = A1$$

The 4th gear wheel has axial play on the shaft. Measure this play as follows:





- Install the -VW387- on the sealing surface of the clutch housing.
- Place the button from the -VAS6079- on the 4th gear wheel.
- Adjust the dial gauge pretension to »0«.
- Raise the 4th gear wheel up as far as the stop and note the measurement result.
- Name this value "B1".
- This is calculated: "A1" minus "B1" = the determined shim thickness.



Determined Shim Thickness		Shim to be Installed in Milli-meter
from	through	
0.625	0.674	0.65
0.675	0.724	0.70
0.725	0.774	0.75
0.775	0.824	0.80
0.825	0.874	0.85
0.875	0.924	0.90
0.925	0.974	0.95
0.975	1.024	1.00
1.025	1.074	1.05
1.075	1.124	1.10
1.125	1.174	1.15
1.175	1.224	1.20
1.225	1.274	1.25
1.275	1.324	1.30
1.325	1.374	1.35
1.375	1.424	1.40
1.425	1.474	1.45
1.475	1.524	1.50
1.525	1.574	1.55
1.575	1.624	1.60
1.625	1.674	1.65
1.675	1.724	1.70
1.725	1.774	1.75

- Measure the shim from the delivered washers, which are needed.

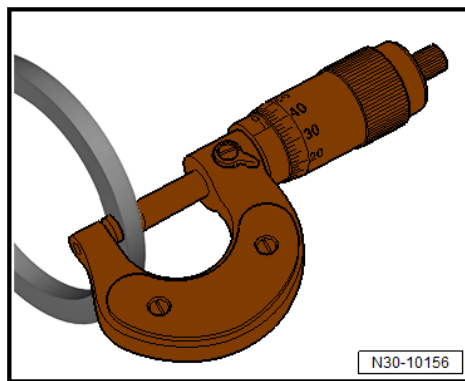


WARNING

Later only install this one shim. Not two.

Store this shim carefully, do not interchange with other shims inadvertently.

Continued with the output shaft 2.





- Place the -T10425/3- on the output shaft 2.

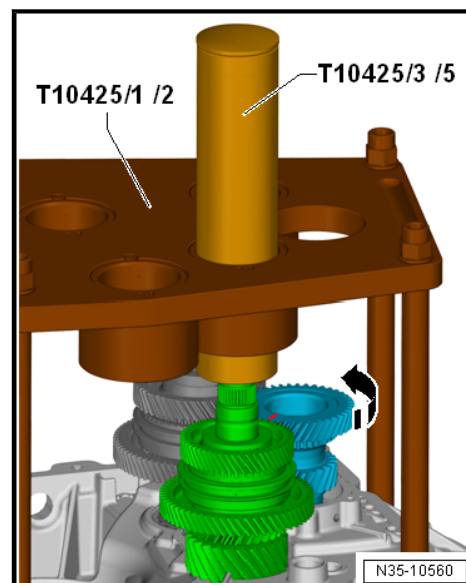
Turn the mark from the outer output shaft »in alignment« with the output shaft 2.



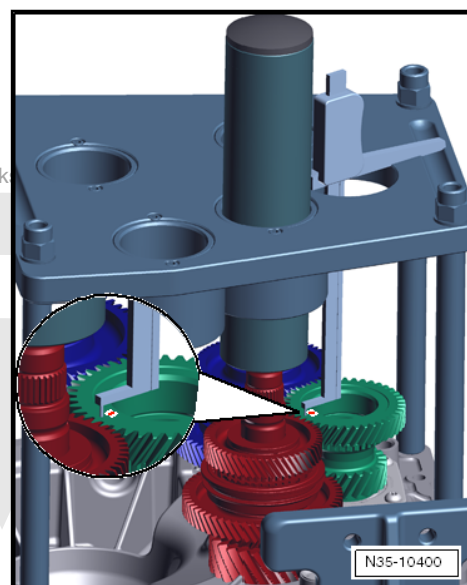
Note

The shaft wheels are toothed at an angle. When turning the shafts it can be the case that they are lifted from the bearing.

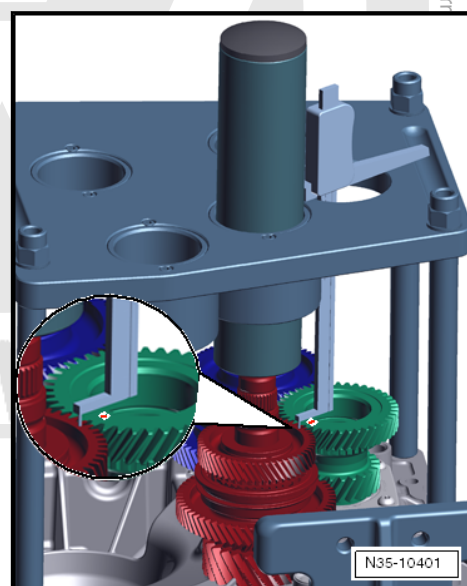
- So that the shafts stay in the bearing, while turning push forcefully by hand on the -T10425/3-. Do not forget the -T10425/5-.



- Place the -VAS6619- on the outer driveshaft. Here shown as »green«. Set the sliding gauge to »zero«.



- Measure on the 6th gear wheel of the output shaft 2 using the -VAS6619-. Here shown as »red«.
- Note this value.
- Name this value "A2 a".





- It is measured three times. Name the additional values “A2_b” and “A2_c”.

Use the mark »present« for orientation.

- Turn the driveshaft 120° in the direction of -arrow- and measure again. The turn 120° additional turn again and measure again.



Note

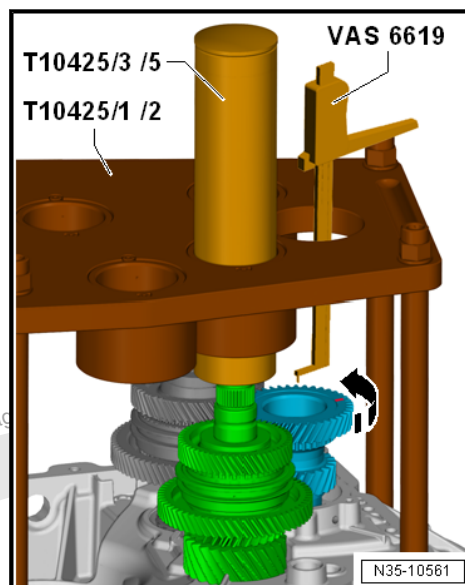
The shaft wheels are toothed at an angle. When turning the shafts it can be the case that they are lifted from the bearing.

- So that the shafts stay in the bearing, while turning push forcefully by hand on the -T10425/3-. Do not forget the -T10425/5-.

Determine the average from the three measured values “A2_a”, “A2_b” and “A2_c”.

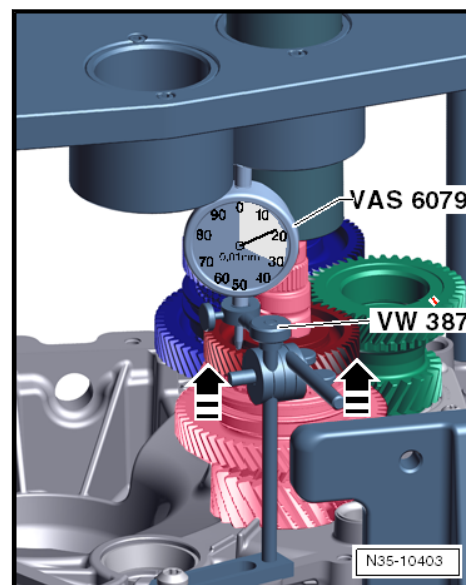
$$\text{Formula: } A2_a + A2_b + A2_c : 3 = A2$$

The 6th gear wheel has axial play on the shaft. Measure this play as follows:





- Install the -VW387- on the sealing surface of the clutch housing.
- Place the button from the -VAS6079- on the 6th gear wheel.
- Adjust the dial gauge pretension to »0«.
- Raise the 6th gear wheel up as far as the stop and note the measurement result.
- Name the value “B2”.
- This is calculated: “A2” minus “B2” = determined shim thickness.



Determined Shim Thickness		Shim to be Installed in Milli-meter
from	through	
0.625	0.674	0.65
0.675	0.724	0.70
0.725	0.774	0.75
0.775	0.824	0.80
0.825	0.874	0.85
0.875	0.924	0.90
0.925	0.974	0.95
0.975	1.024	1.00
1.025	1.074	1.05
1.075	1.124	1.10
1.125	1.174	1.15
1.175	1.224	1.20
1.225	1.274	1.25
1.275	1.324	1.30
1.325	1.374	1.35
1.375	1.424	1.40
1.425	1.474	1.45
1.475	1.524	1.50
1.525	1.574	1.55
1.575	1.624	1.60
1.625	1.674	1.65
1.675	1.724	1.70
1.725	1.774	1.75
1.775	1.824	1.80
1.825	1.874	1.85
1.875	1.924	1.90



- Measure the shim from the delivered washers, which are needed.



WARNING

Later only install this one shim. Not two.

Store this shim carefully, do not interchange with other shims inadvertently.

- Remove the output shaft 1 and 2 and assemble.
- ◆ Output Shaft 1. Refer to ⇒ [“2.2.3 Output Shaft 1, Assembling”, page 182](#).
- ◆ Output Shaft 2. Refer to ⇒ [“2.3.2 Output Shaft 2, Assembling”, page 190](#).
- ◆ Then adjust the output shaft 3.
- First measure the thickness of the gear wheel for the reverse gear.



Note

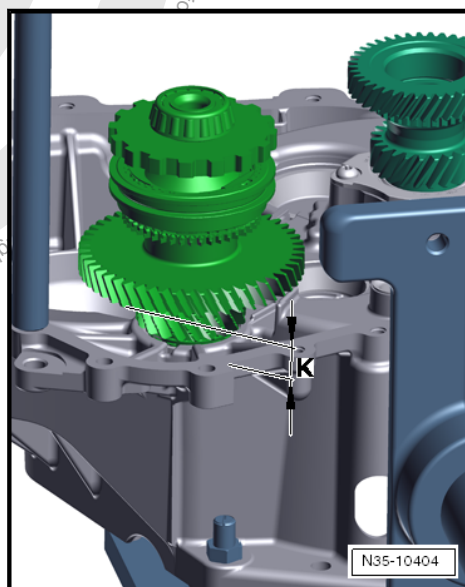
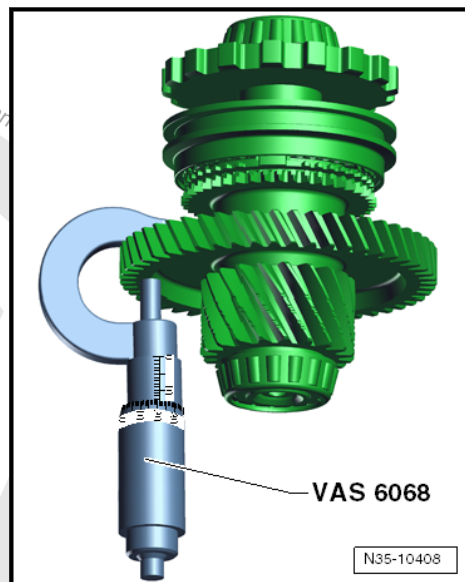
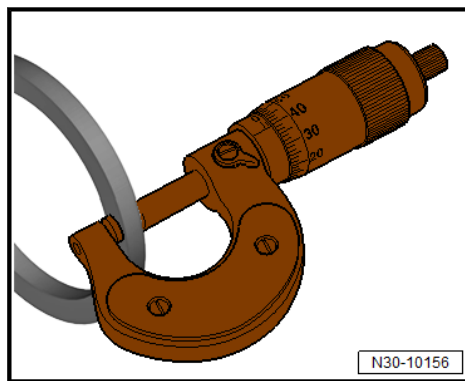
When measuring pay attention that the burr of the teeth is not measured.

- Note this value and name the value “B3”.

Adjusting output shaft 3.

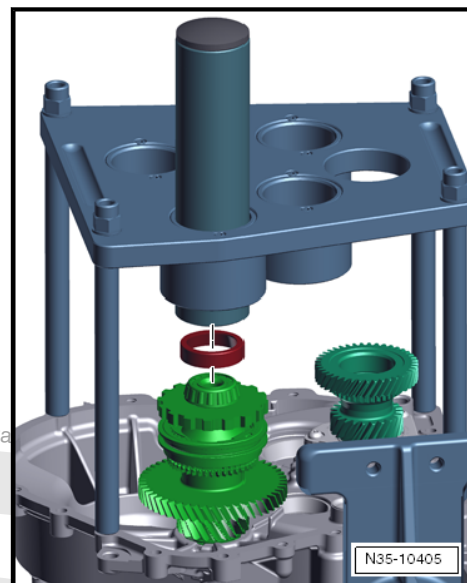
The output shaft 3 is correctly adjusted, when the dimension -K- = 19.9 millimeter.

- Position the output shaft 3 in the bearing.





- Place the bearing shell to be installed on the shaft.
- Place the -T10425/3- on the shaft.

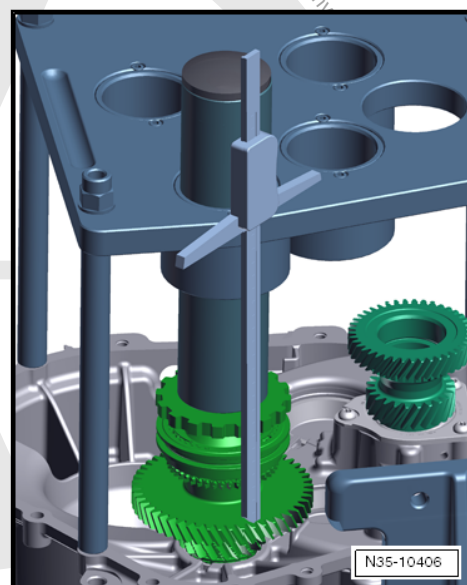


- Position the - VAS6594- on the reverse gear wheel to “zero”.



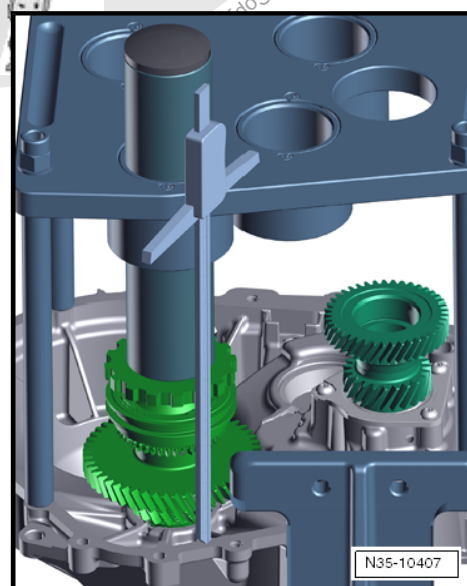
Note

When measuring pay attention that the burr of the teeth is not measured.



- Measure the distance to the housing flange surface.
- Note this value and name the value “A3”.
- For determining the shim to be installed from the value “A3” the »thickness« of the reverse gear wheel B3 is “subtracted”. Name this value “C”.

Formula: “A3” minus “B3” = “C”





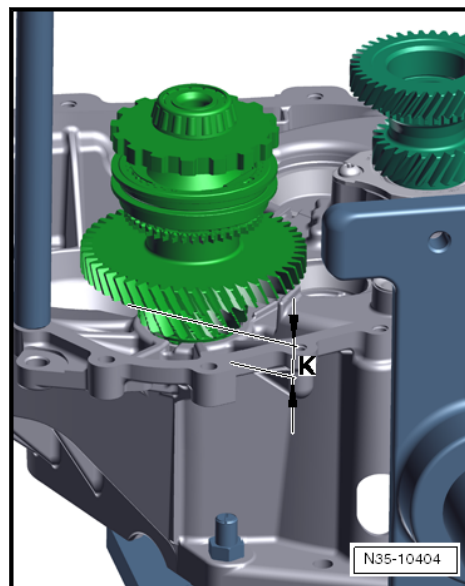
Remember: The output shaft 3 is correctly adjusted, when the dimension -K- = 19.9 millimeter.

- For this reason measure a shim to come to -K- = 19.9 millimeter.

Using the dimension -K- and the dimension "C" the shim thickness to be installed is determined according to the following calculation.

Formula: 19.9 millimeter minus the value for "C" = determined shim thickness.

Determined Shim Thickness		Shim to be Installed in Millimeter
from	through	
0.775	0.824	0.80
0.825	0.874	0.85
0.875	0.924	0.90
0.925	0.974	0.95
0.975	1.024	1.00
1.025	1.074	1.05
1.075	1.124	1.10
1.125	1.174	1.15
1.175	1.224	1.20
1.225	1.274	1.25
1.275	1.324	1.30
1.325	1.374	1.35
1.375	1.424	1.40
1.425	1.474	1.45
1.475	1.524	1.50
1.525	1.574	1.55





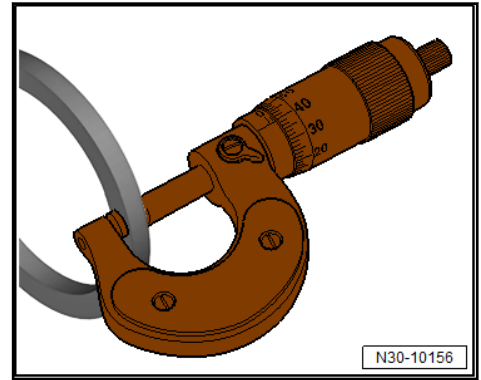
- Measure the shim from the delivered washers, which are needed.



WARNING

Later only install this one shim. Not two.

- 1 - Store this determined shim carefully, do not interchange with other shims inadvertently.
 - 2 - Move the Measuring Tool - T10425- to the side.
 - 3 - Installing the measured shims for the output shaft, bearing shells and guide plate. Refer to ⇒ [“7.4 Clutch Housing, Servicing”, page 148](#) .
 - 4 - Assembling the output shaft 1. Refer to ⇒ [“2.2.3 Output Shaft 1, Assembling”, page 182](#) .
 - 5 - Assembling the output shaft 2. Refer to ⇒ [“2.3.2 Output Shaft 2, Assembling”, page 190](#) .
 - 6 - Position all output shafts in the clutch housing.
 - 7 - Position the Measuring Tool - T10425- on the clutch housing again.
- Determine the transmission housing shims. Refer to ⇒ [“2.5.3 Transmission Housing Shims, Determining”, page 213](#) .



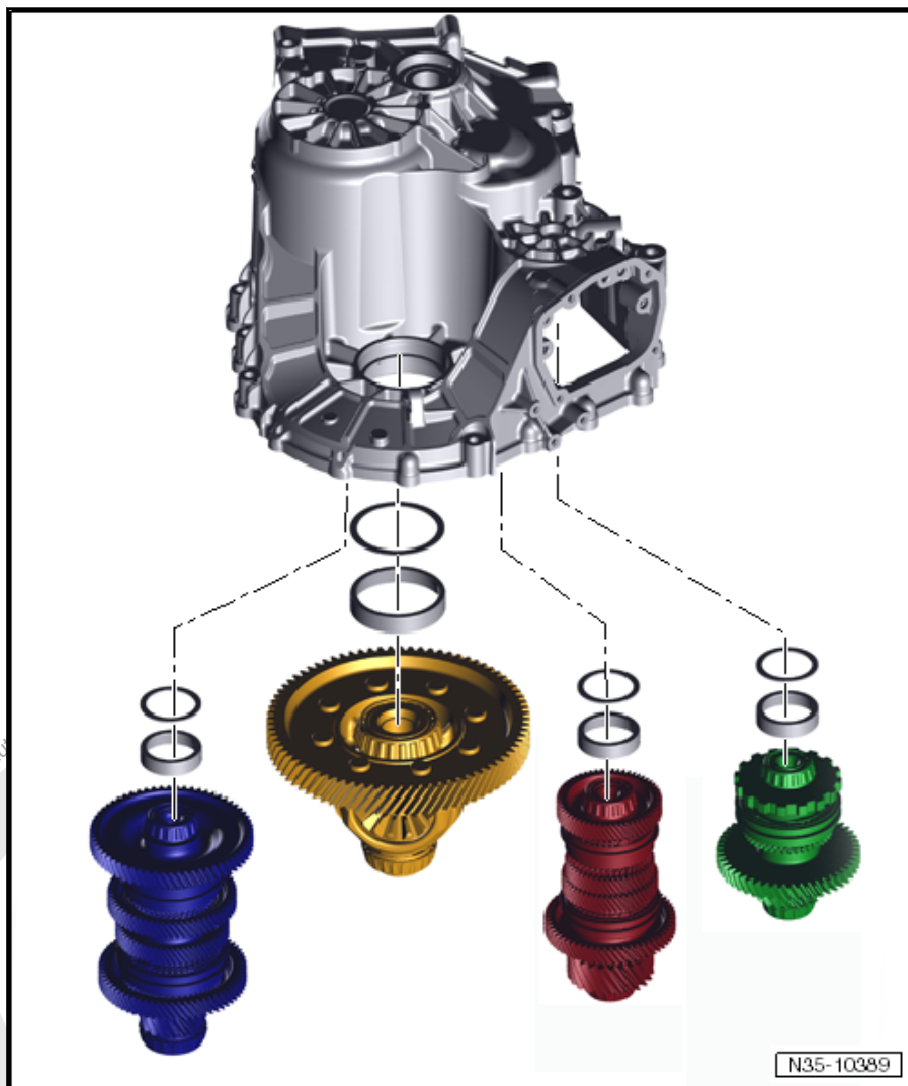
2.5.3 Transmission Housing Shims, Determining

Special tools and workshop equipment required

- ◆ Measuring Tool - T10425-
- ◆ Ruler (2 pc.) - T40100-
- ◆ Not illustrated: Digital Depth Gauge - 300mm - VAS6594-

Brief Description:

In this »step« it is determined, how thick the shim in the transmission housing must be. There are four shims installed in total. On each output shaft one shim. The differential here also has one shim.



- The shims in the transmission housing can only be determined when the shims in the clutch housing are correctly determined or do not have to be measured.
- Only determine the shims in the transmission housing when the shims in the clutch housing are OK.

Procedure:

First it is determined how »high« the shafts are in the clutch housing.

Then the »depth« of the transmission housing is measured.

Both »heights« are subtracted from each other.

The bearing pre-load is given for each shaft in the procedure.
For this reason follow the following procedures.

Because each shaft has a different pretension, follow the procedures exactly and pay attention to the different pretensions.

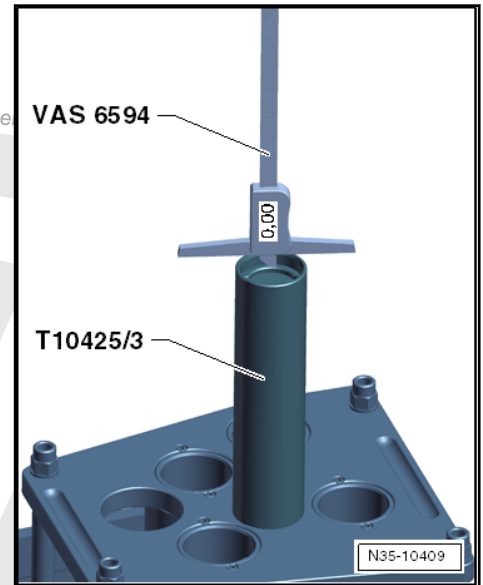
In this way the correct shim can be determined.

- Do not insert the differential yet. The output shaft 1, 2 and 3 remain in their bearings.



Follow the Instructions:

- Measure the height of their -T10425/3- .
- Zero out the -VAS6619- on the collar for the bearing shells.



- Measure the height of the drift.

Note the height of the drift to be used. The height is noted in the following calculations. Name the height of the drift $D = ?$ mm.

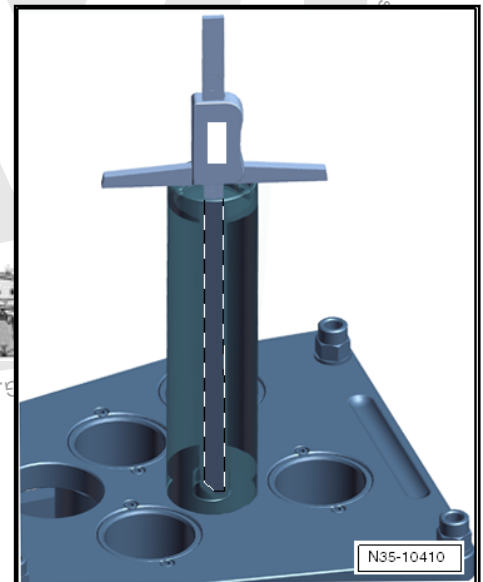
Example: "D" = 237.01 mm



Note

Each drift has a different height. For this reason always measure the drift to be used.

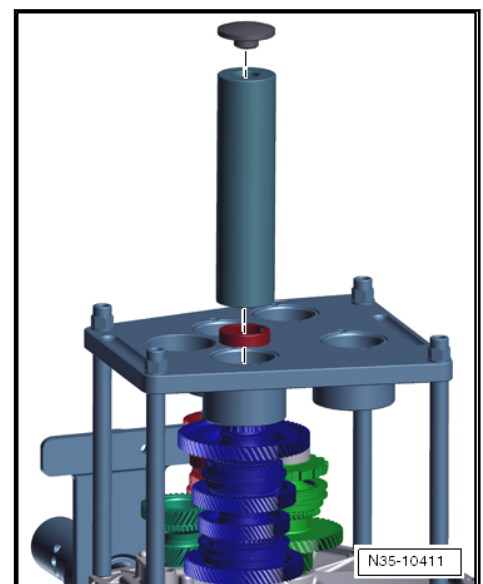
It begins with the output shaft 1



- Position the bearing shell, measuring rod and headpiece.
- Turn the outer driveshaft. While turning push the measuring rod by hand downward with force.

This places the output shaft 1 correctly in its bearing seat.

- Remove the -T10425/5- from the drift and move to the side.





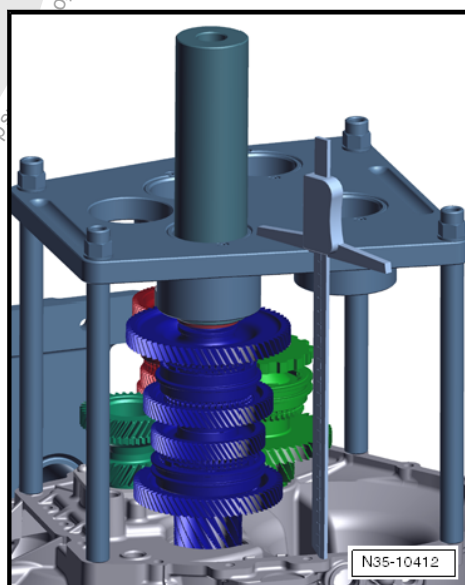
- Zero out the -VAS6594- on the -T10425- .
- Measure the height from the surface of the -T10425- to the flange surface of the clutch housing.

Always measure near the respective bearing area.

- Name this value "a1".
- Note the value.

Example:

"a1" = 264.97 mm



- Measure the height from the drift to the -T10425- .
- Name this value "b1".

Example:

"b1" = 170.83 mm

It is calculated:

"a1" + "b1" minus the drift height "D" = output shaft 1 height

Example:

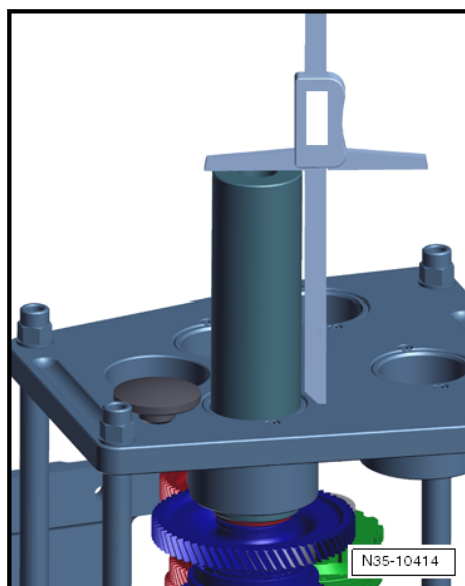
264.97 mm + 170.83 mm – 237.01 mm = 198.79 mm

- Then record the calculated value for the "height of the output shaft 1".

Example: "output shaft 1 height" = 198.79 mm

This value is needed later.

Continued with the output shaft 2.

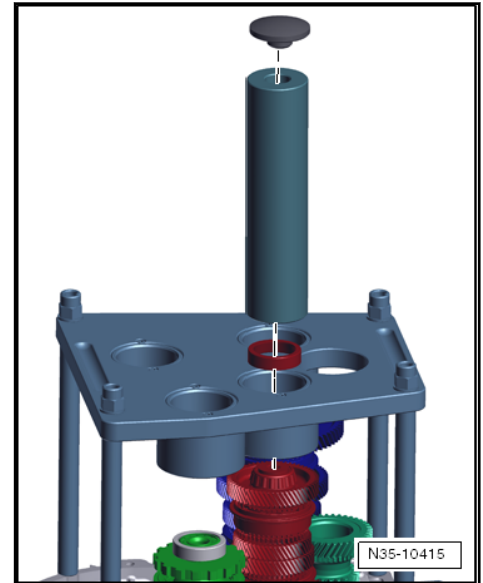




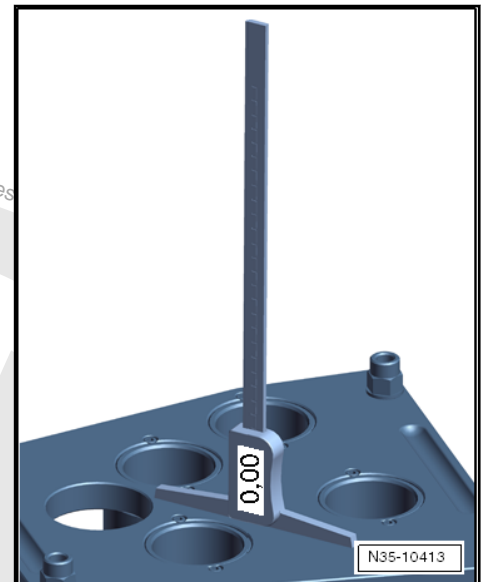
- Position the bearing shell, measuring rod and headpiece to be installed.
- Turn the outer driveshaft. While turning push the measuring rod by hand downward with force.

This places the output shaft 2 correctly in its bearing seat.

- Remove the -T10425/5- from the drift and move to the side.



- Zero out the -VAS6594- on the -T10425- .
- Measure the height from the surface of the -T10425- to the flange surface of the clutch housing.

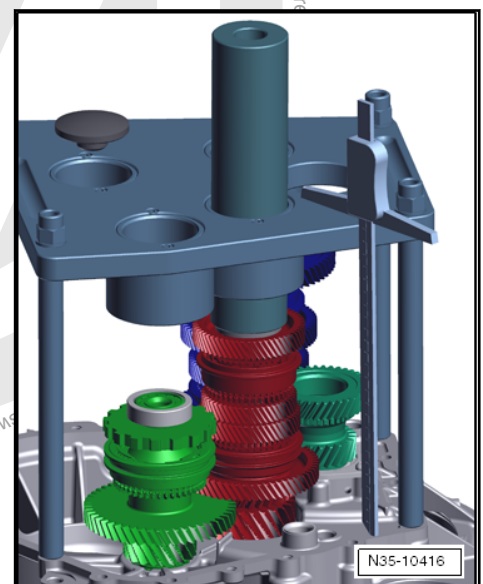


Always measure near the respective bearing area.

- Name this value “a2”.
- Note the value.

Example:

“a2” = 264.93 mm





- Measure the height from the drift to the -T10425- .
- Name this value “b2”.

Example:

“b2” = 145.97 mm

It is calculated:

“a2” + “b2” minus drift height “D” = output shaft 2 height

Example:

264.93 mm + 145.97 mm – 237.01 mm = 173.89 mm

- Then record the calculated value for the “height of the output shaft 2”.

Example: “output shaft 2 height” = 173.89 mm

This value is needed later.

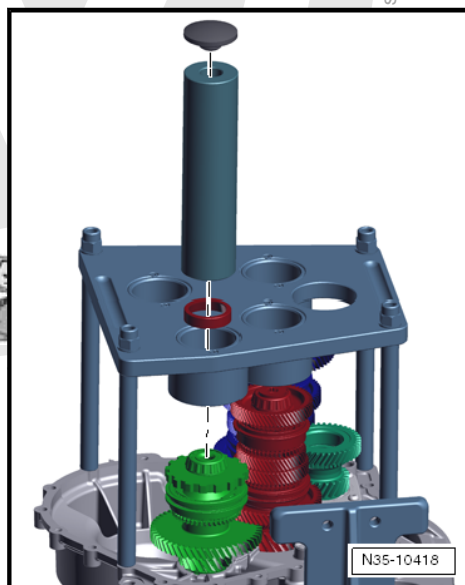
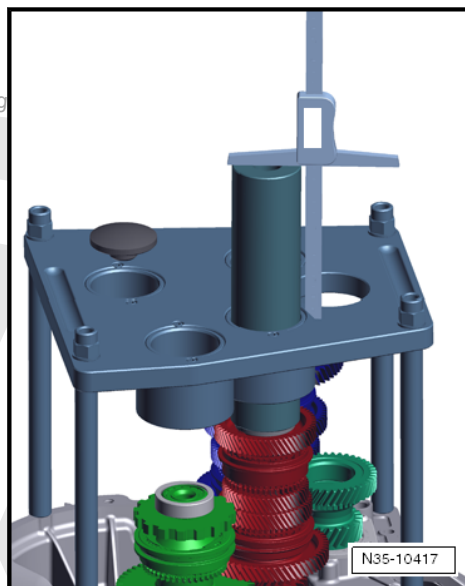
Continued with the output shaft 3.

- Position the bearing shell, measuring rod and headpiece to be installed.
- Turn the outer driveshaft. While turning push the measuring rod by hand downward with force.

This places the output shaft 3 correctly in its bearing seat.

- Remove the -T10425/5- from the drift and move to the side.

- Zero out the -VAS6594- on the -T10425- .
- Measure the height from the surface of the -T10425- to the flange surface of the clutch housing.

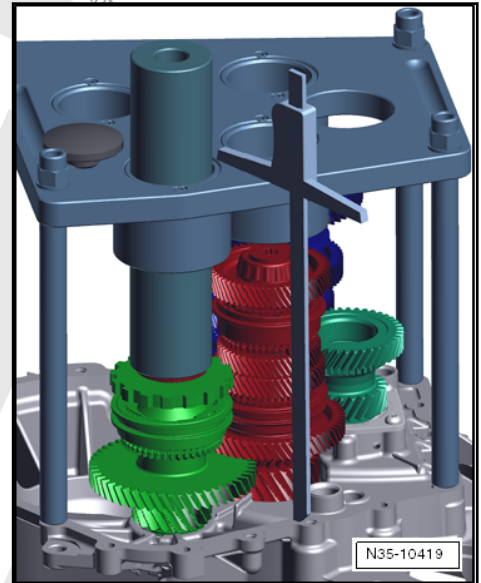


Always measure near the respective bearing area.

- Name this value "a3".
- Note the value.

Example:

"a3" = 264.92 mm



- Measure the height from the drift to the -T10425- .
- Name this value "b3".
- Note the value.

Example:

"b3" = 92.57 mm

It is calculated:

"a3" + "b3" minus drift height "D" = output shaft 3 height

Example:

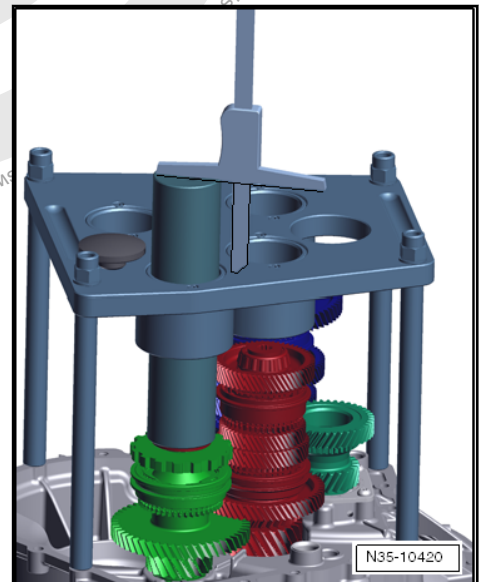
264.92 mm + 92.57 mm - 237.01 mm = 120.48 mm

- Then record the calculated value for the "height of the output shaft 3".

Example: "output shaft 3 height" = 120.48 mm

This value is needed later.

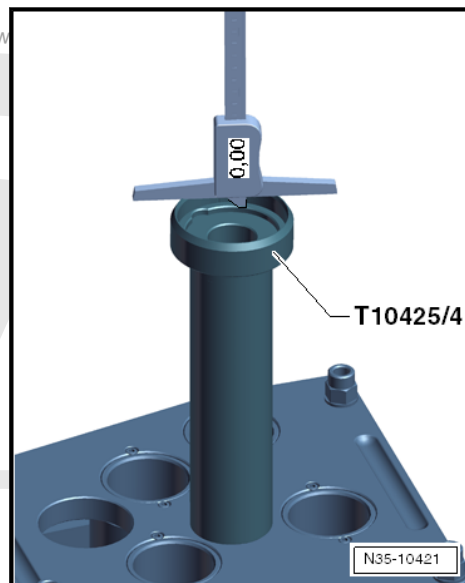
- 1 - Move the Measuring Tool - T10425- to the side.
- 2 - Remove the output shafts 1, 2 and 3.
- 3 - Install the differential.
- 4 - Position the Measuring Tool - T10425- on the clutch housing again.
- 5 - Position the Measuring Tool - Measuring Rod - T10425/3- with Measuring Tool - Adapter - T10425/4- on the Measuring Tool - T10425- .





- Zero out the Digital Depth Gauge w/Measuring Hook - 200mm - VAS6619- on the bearing shell collar.

Check which collar is for the bearing shell.



- Measure the height of the Measuring Tool - Measuring Rod - T10425/3- with the Measuring Tool - Adapter - T10425/4-

Note the height of the drift with adapter to be used. The height is noted in the following calculations. Name the height of the drift $E = ?$ mm.

Example: $E = 263.00$ mm



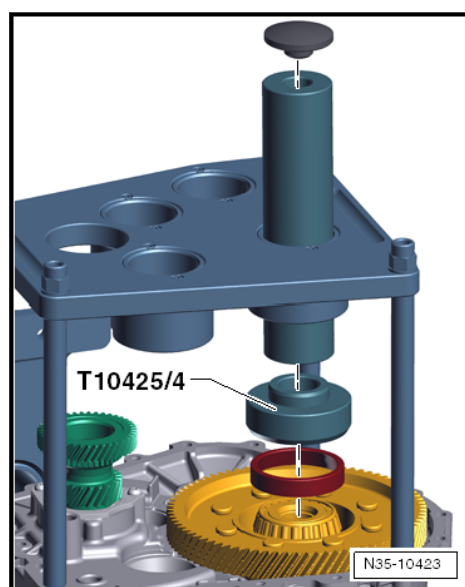
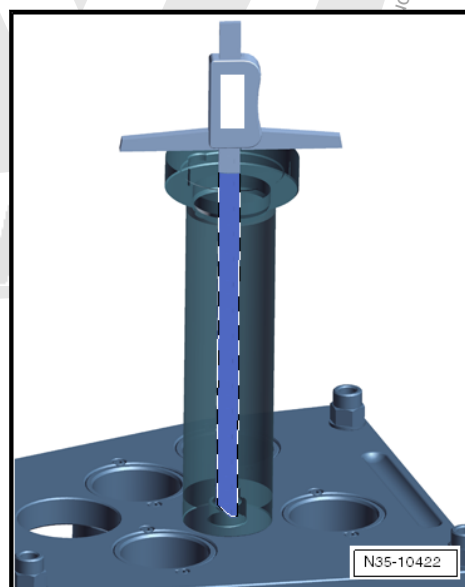
Note

Each drift reacts to the ambient temperature. For this reason measure the drift for each transmission repair. When measuring pay attention that the drift is measured correctly. The depth gauge should »touch« the surface of the measuring tool through the drift. The drift has a shoulder on the »lower end«. The shoulder can lead to malfunctions due to careless measurement.

Always insert and remove the differential using the Lock Carrier Support Tool - 3411- .

- Position the bearing shell, adapter, measuring rod and head-piece.
- Turn the differential. While turning push the measuring rod by hand downward with force.

This places the differential correctly in its bearing seat.





- Zero out the Digital Depth Gauge - 300mm - VAS6594- on the Measuring Tool - T10425- .



- Measure the height from the surface of the Measuring Tool - T10425- to the flange surface of the clutch housing.
- Note the value.
- Name this value “a_{4a}”.

To avoid inaccuracy when measuring, measure on two additional locations.

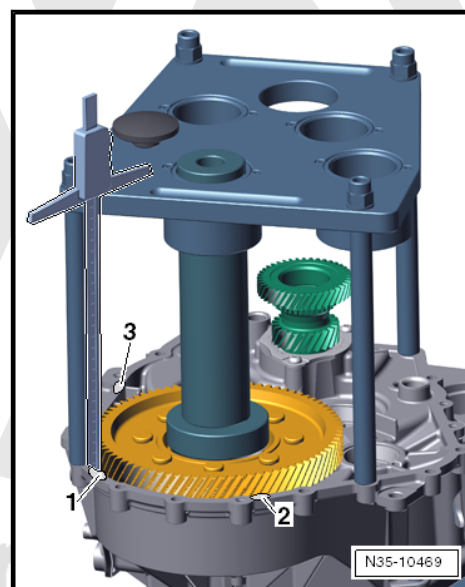
Name these values “a_{4b}” and “a_{4c}”.

- Determine the average from the three measured values.

Formula: $a_{4a} + a_{4b} + a_{4c} : 3 = a_4$

Example:

- “a₄” = $264.96 \text{ mm} + 264.98 \text{ mm} + 264.94 \text{ mm} : 3 = 264.96 \text{ mm}$
- Result dimension “a₄” = 264.96 mm





- Measure the height from the drift to the Measuring Tool - T10425- .
- Name this value “b4”.
- Note the value.

Example:

“b4” = 13.21 mm

It is calculated:

“a4” + “b4” minus the hight of the drift “E” = hight of the differential

Example:

$264.96 \text{ mm} + 13.21 \text{ mm} - 263.00 \text{ mm} = 15.17 \text{ mm}$

- Note the calculated value for the “differential height”.

Example: “differential height” = 15.17 mm

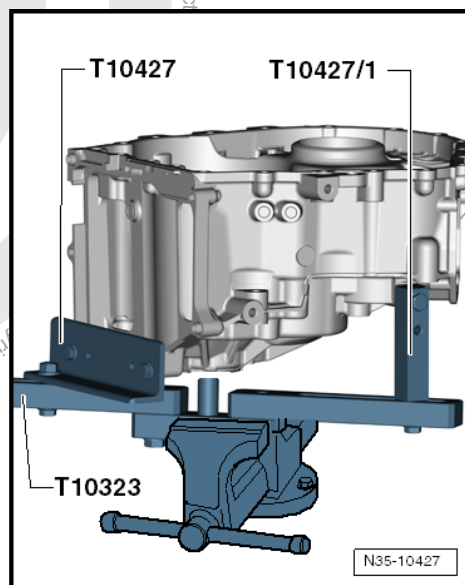
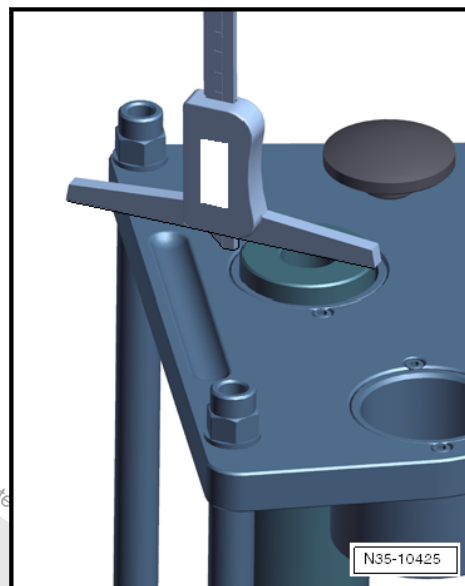
This value is needed later.

This measurement determines how »high« the shaft is in the clutch housing.

The »depth« of the transmission housing is measured in later procedures.

Please follow the instructions:

- The clutch housing sealing surface is clean, level and not »destroyed or damaged«.
- Secure the transmission housing with the Support Bridge - T10323- in the support bridge.

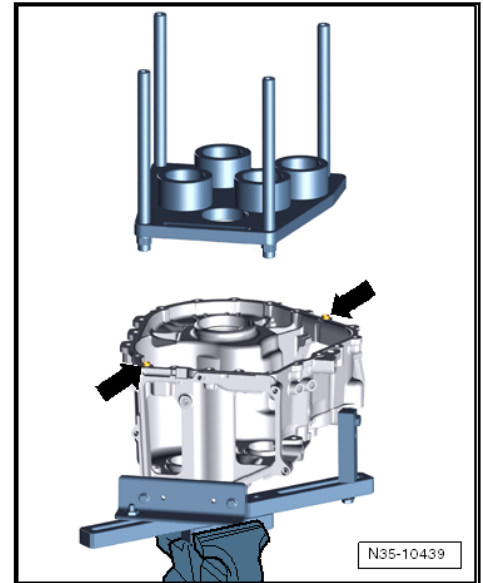




- Install the alignment sleeves in the transmission housing.
- Place the measuring tool on the transmission housing.
- Place the Measuring Tool - T10425- on the alignment sleeves.

Start again with the measurement for the output shaft 1:

The bearing pre-load for this output shaft 1 is: 0.25 mm.

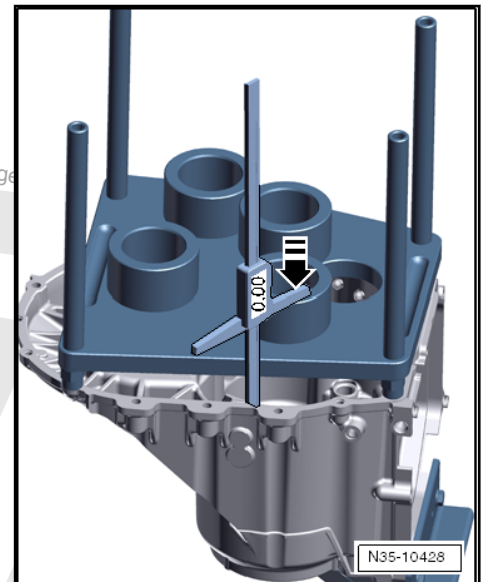


- Zero out the Digital Depth Gauge - 300mm - VAS6594- on the flange surface.



Note

When zeroing out press on the arm of the depth gauge - arrow-.





- Measure the seating of the bearing shell in the transmission housing.
- Then record the calculated value for the “output shaft 1 depth”.

Example: “output shaft 1 depth” = 199.89 mm

Now the value for the “output shaft 1 height” is required.

- Perform the following calculation: “output shaft 1 depth” minus the “output shaft 1 height” + bearing pre-load 0.25 mm = determined shim thickness.

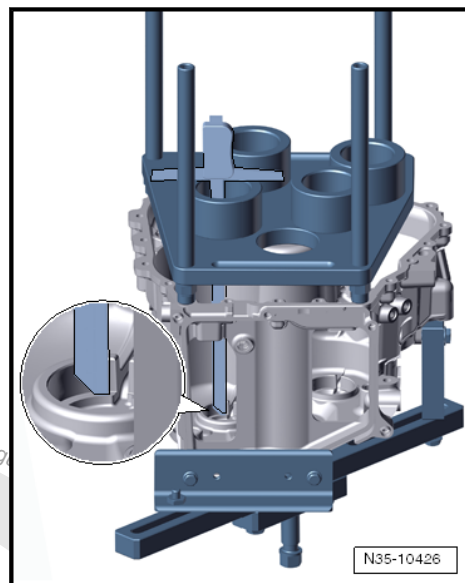
Example: “output shaft 1 height” = 198.79 mm

Example: “output shaft 1 depth” = 199.89 mm

199.89 mm minus 198.79 mm + 0.25 mm = 1.35 mm

- Note the calculated value for the “determined shim thickness”.

Example: “determined shim thickness” = 1.35 mm



Determined shim thickness in the output shaft 1 transmission housing		Shim to be installed in millimeter
from	through	
0.625	0.674	0.65
0.675	0.724	0.70
0.725	0.774	0.75
0.775	0.824	0.80
0.825	0.874	0.85
0.875	0.924	0.90
0.925	0.974	0.95
0.975	1.024	1.00
1.025	1.074	1.05
1.075	1.124	1.10
1.125	1.174	1.15
1.175	1.224	1.20
1.225	1.274	1.25
1.275	1.324	1.30
1.325	1.374	1.35
1.375	1.424	1.40
1.425	1.474	1.45
1.475	1.524	1.50
1.525	1.574	1.55
1.575	1.624	1.60
1.625	1.674	1.65
1.675	1.724	1.70
1.725	1.774	1.75
1.775	1.824	1.80
1.825	1.874	1.85



- Measure the shim from the delivered washers, which are needed.



WARNING

Later only install this one shim. Not two.

Additionally with the measurements for the output shaft 2:

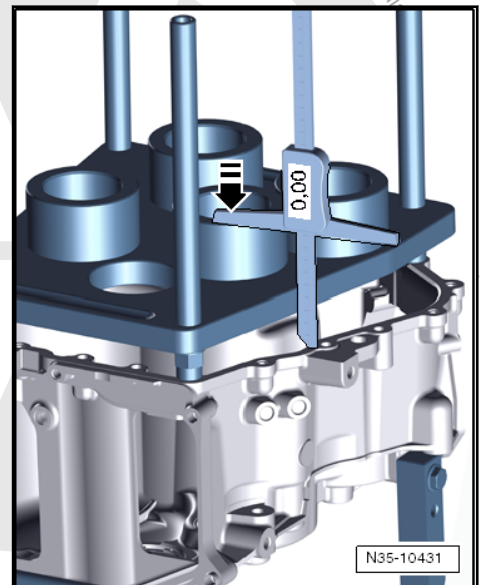
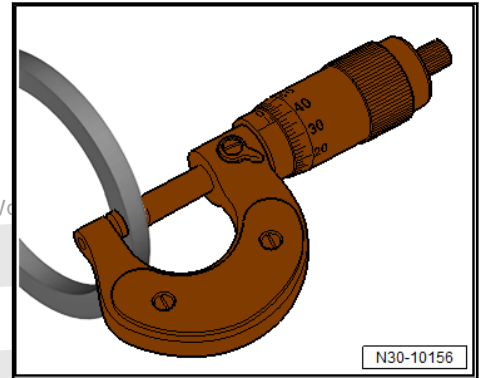
The bearing pre-load for this output shaft 2 is: **0.30 mm**.

- Zero out the Digital Depth Gauge - 300mm - VAS6594- on the flange surface.



Note

Push on the depth gauge arm -arrow-.





- Measure the seating of the bearing shell in the transmission housing.
- Then record the calculated value for the “depth of the output shaft 2”.

Example: “output shaft 2 depth” = 175.18 mm

Now the value for the “output shaft 2 height” is required.

- Perform the following calculation: “output shaft 2 depth” minus the “output shaft 2 height” + bearing pre-load 0.30 mm = determined shim thickness.

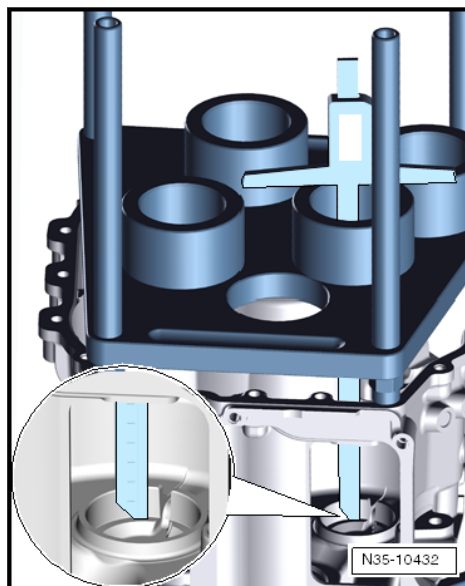
Example: “output shaft 2 height” = 173.89 mm

Example: “output shaft 2 depth” = 175.18 mm

175.18 mm minus 173.89 mm + 0.30 mm = 1.59 mm

- Note the calculated value for the “determined shim thickness”.

Example: “determined shim thickness” = 1.59 mm



Determined shim thickness in the output shaft 2 transmission housing		Shim to be installed in millimeter
from	through	
0.625	0.674	0.65
0.675	0.724	0.70
0.725	0.774	0.75
0.775	0.824	0.80
0.825	0.874	0.85
0.875	0.924	0.90
0.925	0.974	0.95
0.975	1.024	1.00
1.025	1.074	1.05
1.075	1.124	1.10
1.125	1.174	1.15
1.175	1.224	1.20
1.225	1.274	1.25
1.275	1.324	1.30
1.325	1.374	1.35
1.375	1.424	1.40
1.425	1.474	1.45
1.475	1.524	1.50
1.525	1.574	1.55
1.575	1.624	1.60
1.625	1.674	1.65
1.675	1.724	1.70
1.725	1.774	1.75
1.775	1.824	1.80
1.825	1.874	1.85



- Measure the shim from the delivered washers, which are needed.



WARNING

Later only install this one shim. Not two.

Additionally with the measurements for the output shaft 3:

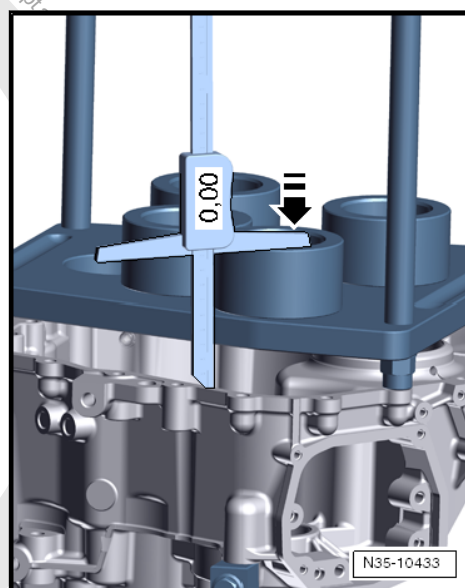
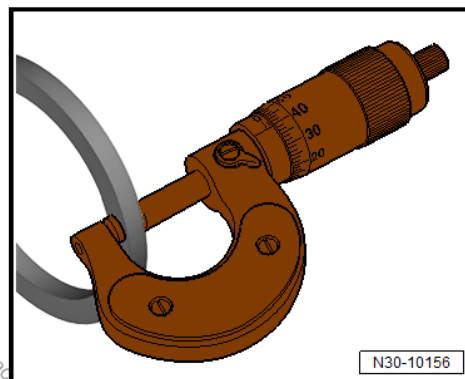
The bearing pre-load for this output shaft 3 is: 0.15 mm.

- Zero out the Digital Depth Gauge - 300mm - VAS6594- on the flange surface.



Note

When zeroing out press on the arm of the depth gauge -arrow-.





- Measure the seating of the bearing shell in the transmission housing.
- Then record the calculated value for the “depth of the output shaft 3”.

Example: “output shaft 3 depth” = 121.40 mm

Now the value for the “output shaft 3 height” is required.

- Perform the following calculation: “output shaft 3 depth” minus the “output shaft 3 height” + bearing pre-load 0.15 mm = determined shim thickness.

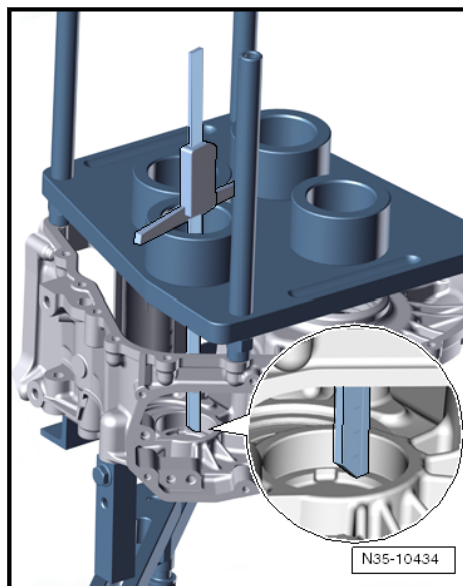
Example: “output shaft 3 height” = 120.48 mm

Example: “output shaft 3 depth” = 121.40 mm

121.40 mm minus 120.48 mm + 0.15 mm = 1.07 mm

- Note the calculated value for the “determined shim thickness”.

Example: “determined shim thickness” = 1.07 mm



Determined shim thickness in the output shaft 3 transmission housing		Shim to be installed in millimeter
from	through	
0.625	0.674	0.65
0.675	0.724	0.70
0.725	0.774	0.75
0.775	0.824	0.80
0.825	0.874	0.85
0.875	0.924	0.90
0.925	0.974	0.95
0.975	1.024	1.00
1.025	1.074	1.05
1.075	1.124	1.10
1.125	1.174	1.15
1.175	1.224	1.20
1.225	1.274	1.25
1.275	1.324	1.30
1.325	1.374	1.35
1.375	1.424	1.40
1.425	1.474	1.45
1.475	1.524	1.50
1.525	1.574	1.55
1.575	1.624	1.60
1.625	1.674	1.65
1.675	1.724	1.70



- Measure the shim from the delivered washers, which are needed.



WARNING

Later only install this one shim. Not two.

Additionally with the measurements for the differential:

The bearing pre-load for the differential is: 0.20 mm.

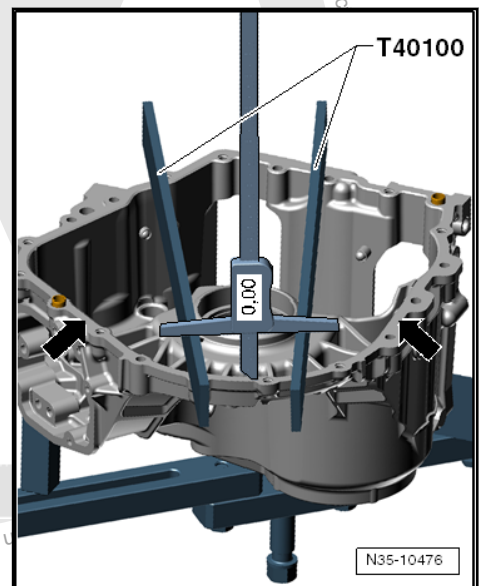
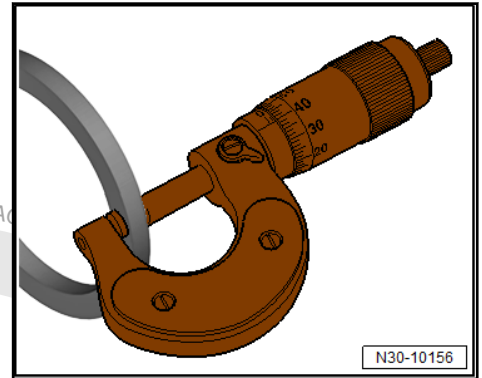
Remove the Measuring Tool - T10425-

Determine the depth of the differential:

To calculate the depth of the differential as close as possible, three measuring points are measured on the bearing seat. The measurement results are determined.

- Place the second straight edge Ruler (2 pc.) - T40100- on the flange surface.
- Zero out the Digital Depth Gauge - 300mm - VAS6594- on the flange surface.

The measurement is repeated on two additional points -arrows- on the flange surface to increase the measuring exactness.



- Measure three times on the bearing seat -arrows-.

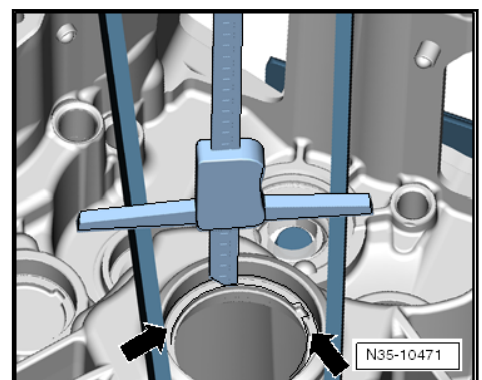
Carefully measure.

- Note the average of these three measurements.

Example: 16.28 mm + 16.27 mm + 16.29 mm3 = 16.28 mm

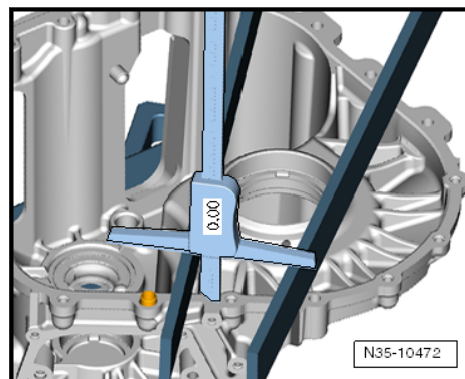
Example: first measurement result = 16.28 mm

The two measurements follow:





- Place both straight edges Ruler (2 pc.) - T40100- on the flange surfaces.
- Zero out the Digital Depth Gauge - 300mm - VAS6594- on the flange surface.



- Measure three times on the bearing seat -arrows-.

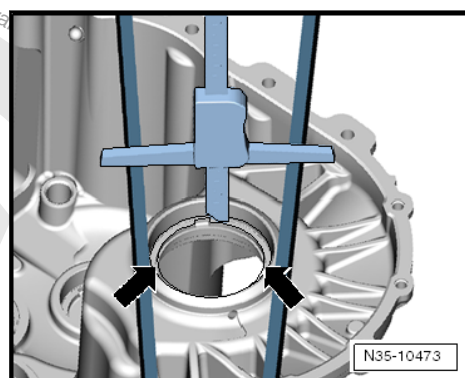
Carefully measure.

- Note the average of these three measurements.

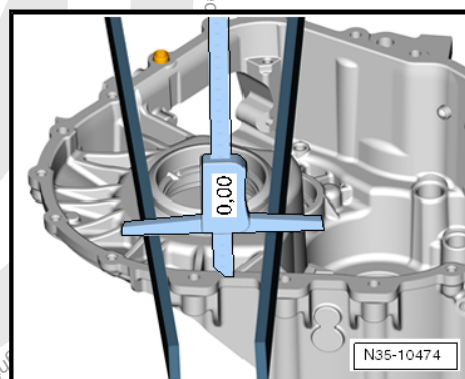
Example: $16.25 \text{ mm} + 16.24 \text{ mm} + 16.27 \text{ mm} \div 3 = 16.25 \text{ mm}$

Example: second measurement result = 16.25 mm

The three measurements follow:



- Place both straight edges Ruler (2 pc.) - T40100- on the flange surfaces.
- Zero out the Digital Depth Gauge - 300mm - VAS6594- on the flange surface.





- Measure three times on the bearing seat -arrows-.

Carefully measure.

- Note the average of these three measurements.

Example: $16.24 \text{ mm} + 16.24 \text{ mm} + 16.21 \text{ mm} \div 3 = 16.23 \text{ mm}$

Example: third measurement result = 16.23 mm

Calculate the average from all three measurement results.

Example: $16.28 \text{ mm} + 16.25 \text{ mm} + 16.23 \text{ mm} \div 3 = 16.253 \text{ mm}$

- Round mathematically correctly: = 16.25
- Then record the calculated value for the “differential depth”.

Example: “differential depth” = 16.25 mm

Now the value for the “differential height” is required.

- Perform the following calculation: “differential depth” minus the “differential height” + bearing pre-load 0.20 mm = determined shim thickness.

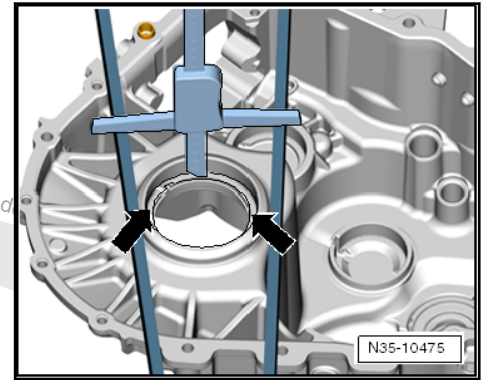
Example: “differential height” = 15.17 mm

Example: “differential depth” = 16.25 mm

$16.25 \text{ mm} \text{ minus } 15.17 \text{ mm} + 0.20 \text{ mm} = 1.28 \text{ mm}$

- Note the calculated value for the “determined shim thickness”.

Example: “determined shim thickness” = 1.28 mm



Determined shim thickness of the differential		Shim to be installed in millimeter
from	through	
0.625	0.674	0.65
0.675	0.724	0.70
0.725	0.774	0.75
0.775	0.824	0.80
0.825	0.874	0.85
0.875	0.924	0.90
0.925	0.974	0.95
0.975	1.024	1.00
1.025	1.074	1.05
1.075	1.124	1.10
1.125	1.174	1.15
1.175	1.224	1.20
1.225	1.274	1.25
1.275	1.324	1.30
1.325	1.374	1.35
1.375	1.424	1.40



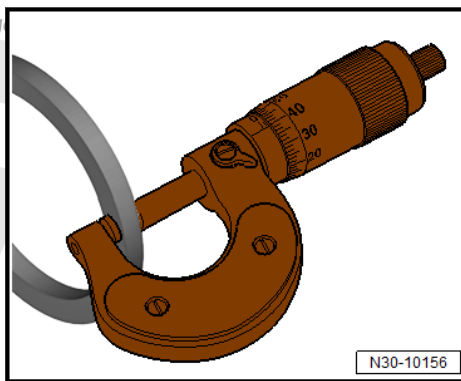
- Measure the shim from the delivered washers, which are needed.



WARNING

Later only install this one shim. Not two.

- Install the shims and bearing shells from the transmission housing. Refer to ⇒ [“7.3 Transmission Housing, Servicing”, page 146](#).
- Assembling the transmission. Refer to ⇒ [“6.2.2 Transmission, Assembling”, page 131](#).





3 Parking Lock

⇒ "3.1 Parking Lock Cover, Removing and Installing", page 233

⇒ "3.2 Parking Lock, Removing and Installing", page 235

3.1 Parking Lock Cover, Removing and Installing

Special tools and workshop equipment required

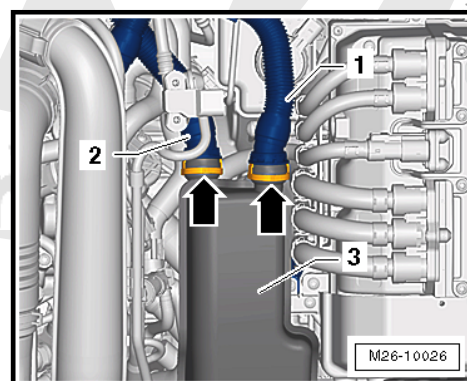
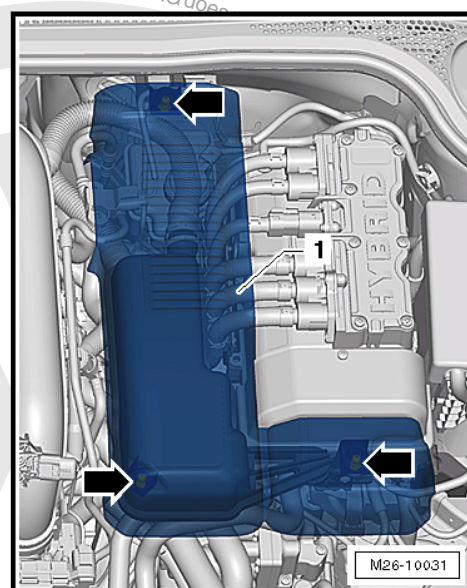
- ◆ Pry Lever - 80-200-

Removing

- The transmission is installed.
- The selector lever is in P.
- Unclip and remove the damper cover -1- upward from the retainers -arrows-.

Vehicles with Secondary Air Injection (AIR) System

- Squeeze the locking ring -arrows- on both sides and remove the air lines -1 and 2- from the damper -3-.





- Remove the damper -1- upward from the rubber bushings -arrows-.

For All Vehicles



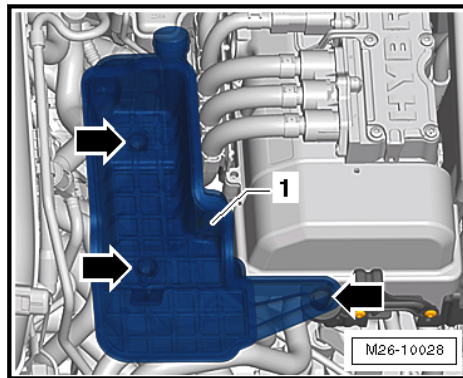
WARNING

Beware of the danger of electrocution.

An electrical shock can result in death.

Follow the High Voltage System General Warnings. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System General Warnings .

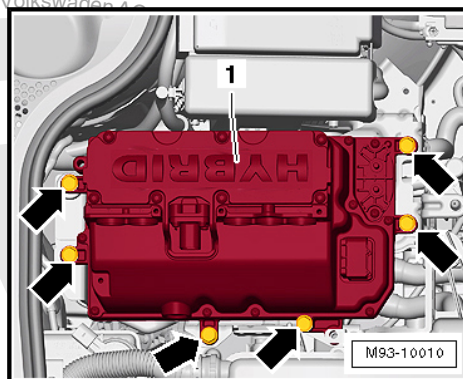
- ◆ *A high voltage technician must de-energize the high voltage system before any work can be performed on the high voltage system or before any servicing work can be performed on the body.*
- ◆ *Only hybrid electrically instructed persons may perform all work on a vehicle with a high voltage system. All work must be performed by a high voltage technician.*



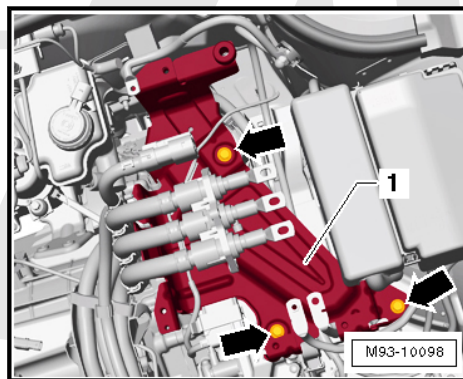
WARNING

High voltage at the high voltage system of the hybrid vehicle. Danger of electrocution! The following procedure requires work on the high voltage system. To de-energize the high voltage system. Refer to ⇒ Hybrid Electrical System; Rep. Gr. 93 ; High Voltage System, De-energizing .

- Remove the Electric Drive Power and Control Electronics - JX1- . Refer to ⇒ Electrical Equipment; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .



- Remove the bracket -1- for the Electric Drive Power and Control Electronics - JX1- -arrows-. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage Cables; High Voltage Battery High Voltage Cable Set, Removing and Installing .

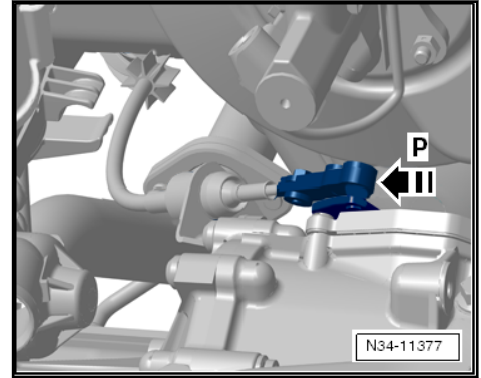




- Remove the selector lever cable from the transmission selector lever using Pry Lever - 80-200- .

Note

- ◆ *Make sure the selector lever is in "P".*
- ◆ *Push the selector lever all the way toward the cable bracket by hand in direction of -arrow-.*
- Remove the bolt -3- and remove the selector lever -4-.

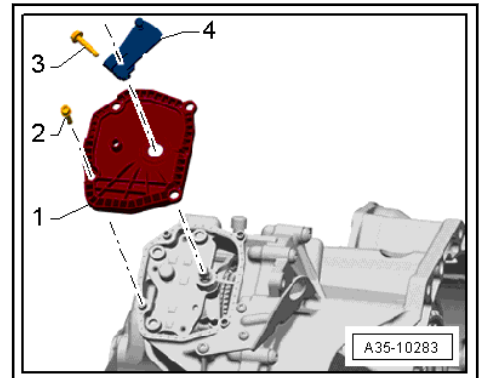


- Remove the bolts -2- and the parking lock cover -1-.

Installing

The parking lock cover must be replaced if there are leaks on the gearshift shaft seal or on the parking lock cover.

- Clean the sealing surface and the parking lock cover -1-.
- Install the parking lock cover -1- and the bolts -2-.
- Install the selector lever -4- and the bolt -3-.
- Adjust the selector lever cable. Refer to ⇒ ["2.7 Selector Lever Cable, Checking and Adjusting", page 99](#) .
- The rest of the installation is performed in reverse order of removal. When doing this, install the Electric Drive Power And Control Electronics - JX1- . Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; Electric Drive Power and Control Electronics; Electric Drive Power and Control Electronics, Removing and Installing .
- Energize the high voltage system and complete the required documentation. Refer to ⇒ Electrical System Hybrid; Rep. Gr. 93 ; High Voltage System, Energizing .



Tightening Specifications

- ◆ Transmission selector lever to selector shaft Refer to ⇒ ["2.1 Overview - Selector Mechanism", page 83](#) .

Component	Tightening Specification
Parking lock cover to transmission housing	8 Nm

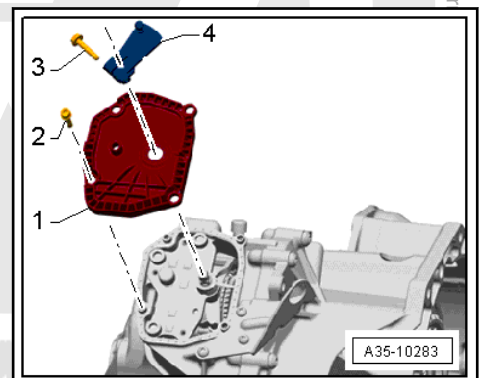
3.2 Parking Lock, Removing and Installing

Removing

- The transmission is installed.
- Remove the cover from the parking lock -1-. Refer to ⇒ ["3.1 Parking Lock Cover, Removing and Installing", page 233](#) .
- Remove the bolts -2- and pull the parking lock -1- off the alignment sleeves -arrows-.

It the parking lock cannot be removed by hand:

- Mount Slide Hammer Set - VW771- with Slide Hammer Set - Hook - VW771/37- behind the parking lock and remove it by pulling alternating from side to side.





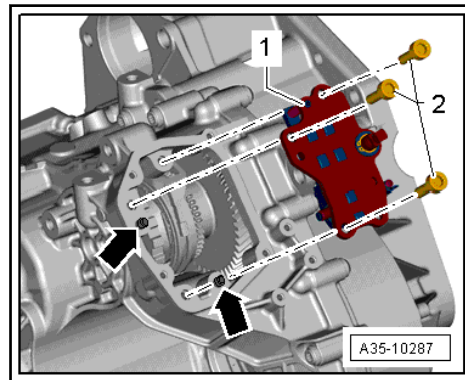
- Replace the bolts -2- after removing them.

Installing

- Place the parking lock -1- on the alignment sleeves -arrows-.
- Install new bolts -2-.
- Install the cover for the parking lock -1-. Refer to ⇒ [“3.1 Parking Lock Cover, Removing and Installing”, page 233](#).

Tightening Specifications

Component	Tightening Specification
Parking lock to the transmission housing <ul style="list-style-type: none">• Replace the bolts after removing them.	20 Nm +90°

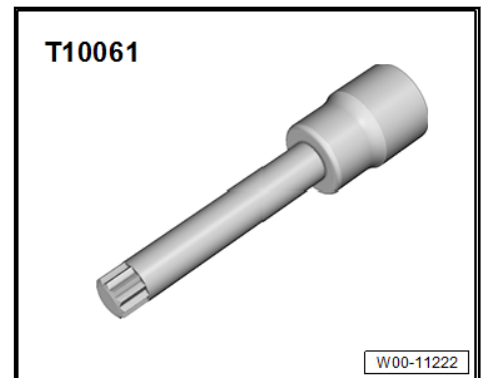




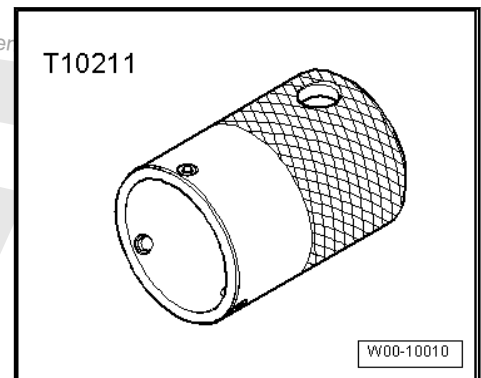
4 Special Tools

Special tools and workshop equipment required

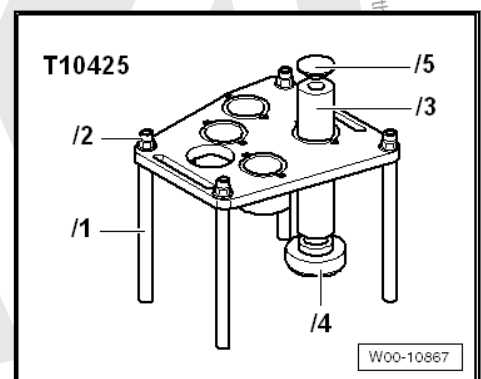
- ◆ Socket - Xzn 14 - T10061-



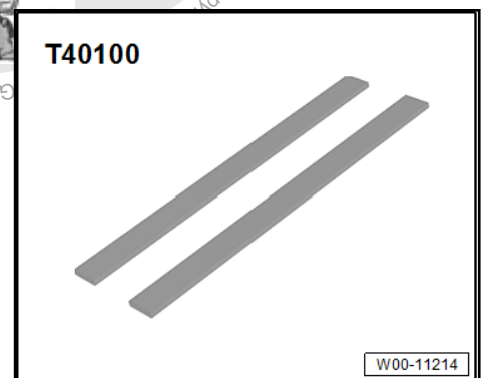
- ◆ Multi-Pin Connector Tool - T10211-



- ◆ Measuring Tool - T10425-

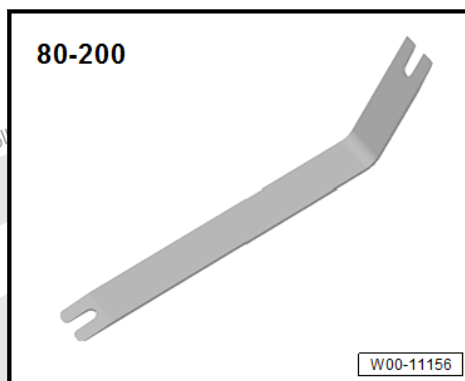


- ◆ Ruler (2 pc.) - T40100-

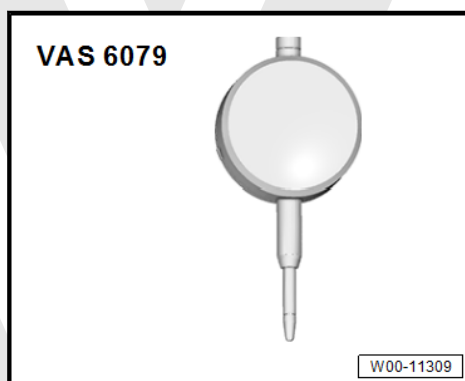




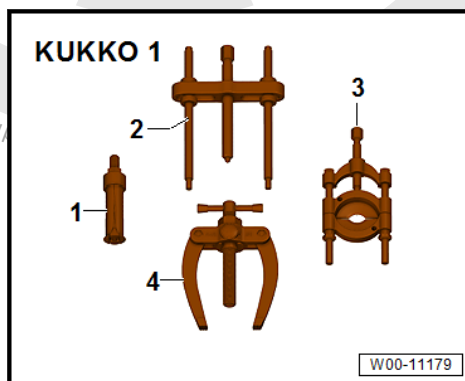
◆ Pry Lever - 80-200-



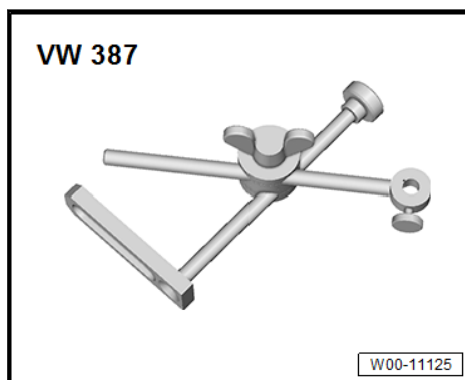
◆ Dial Gauge - 0-10mm - VAS6079-



◆ -3- Puller - VAS251413- (Kukko 17/3)

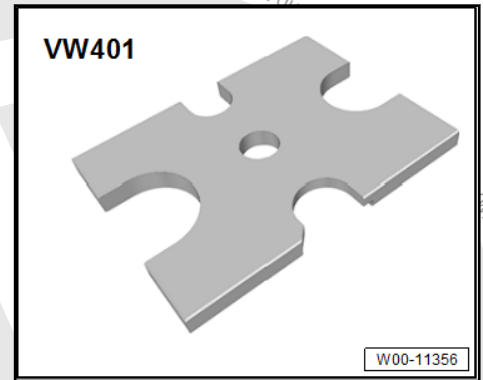


◆ Dial Gauge Holder - VW387-

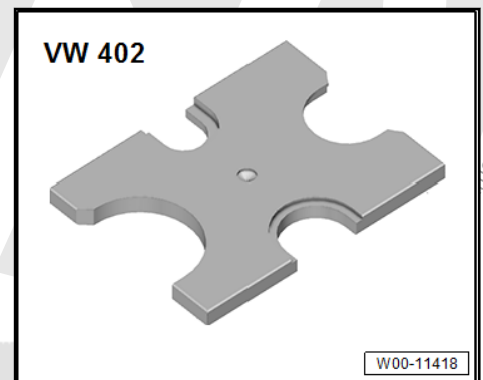




◆ Press Plate - VW401-



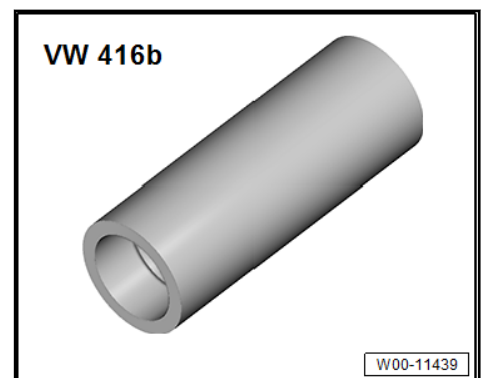
◆ Press Plate - VW402-



◆ Press Piece - 60mm - VW415A-

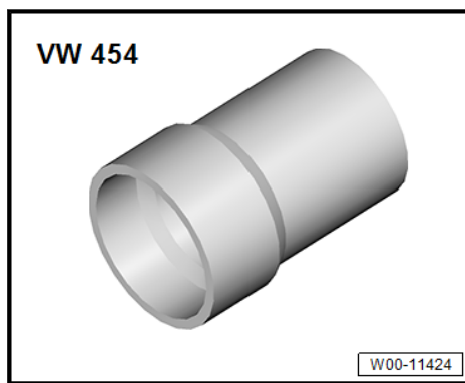


◆ Press Piece - 37mm - VW416B-

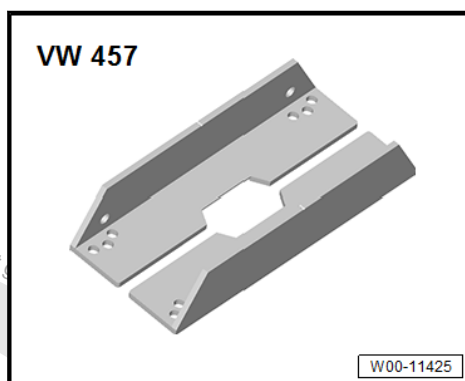




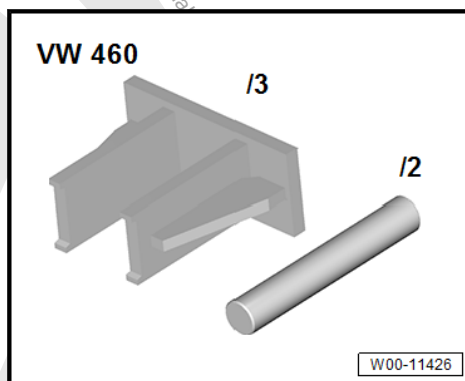
◆ Press Piece - Multiple Use - VW454-



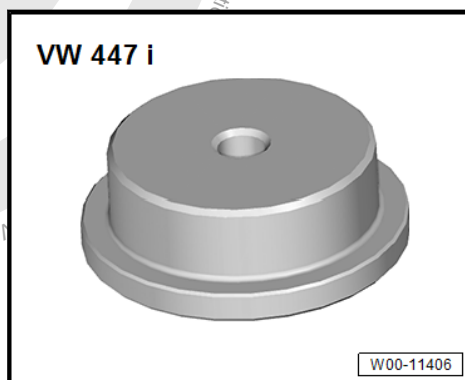
◆ Support Channels - VW457-



◆ Removal Device - Component 2 - VW460/2-

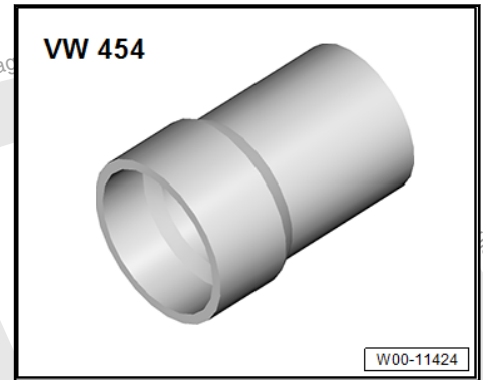


◆ Press Piece - Multiple Use - VW447i-





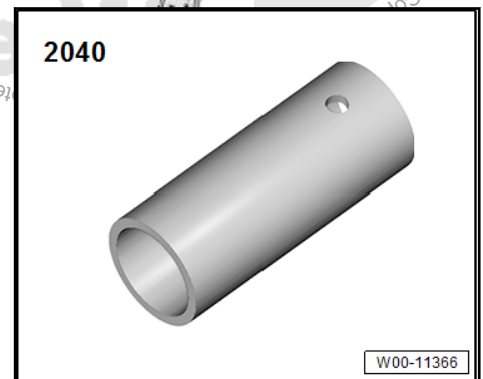
- ◆ Press Piece - Multiple Use - VW454-



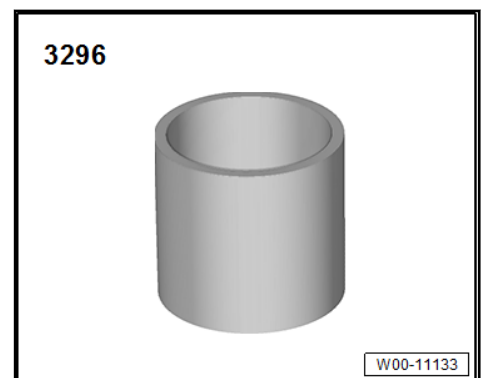
- ◆ Press Piece - Multiple Use - VW455-



- ◆ Press Piece - Front Control Arm - 2040-



- ◆ Press Piece - Reverse Gear Syncro - 3296-



- ◆ Not illustrated: Digital Depth Gauge w/Measuring Hook - 200mm - VAS6619-
- ◆ Digital Depth Gauge - 300mm - VAS6594-



39 – Final Drive, Differential

1 Seals

⇒ [“1.1 Overview - Component Location Seals”, page 242](#)

⇒ [“1.2 Left Seal, Replacing”, page 242](#)

⇒ [“1.3 Right Seal, Replacing”, page 245](#)

1.1 Overview - Component Location Seals

1 - Input Shaft Seal, Replacing

- ❑ Always replace. Refer to ⇒ [“2.4 Input Shaft Seal, Replacing”, page 45](#).

2 - Inner Input Shaft Seal

- ❑ Always replace. Refer to ⇒ [“2.5 Inner Input Shaft Seal, Replacing”, page 47](#).

3 - Right Stub Shaft

4 - Bolt

- ❑ 30 Nm

5 - Locking Ring

- ❑ Always replace

6 - O-Ring

- ❑ Always replace

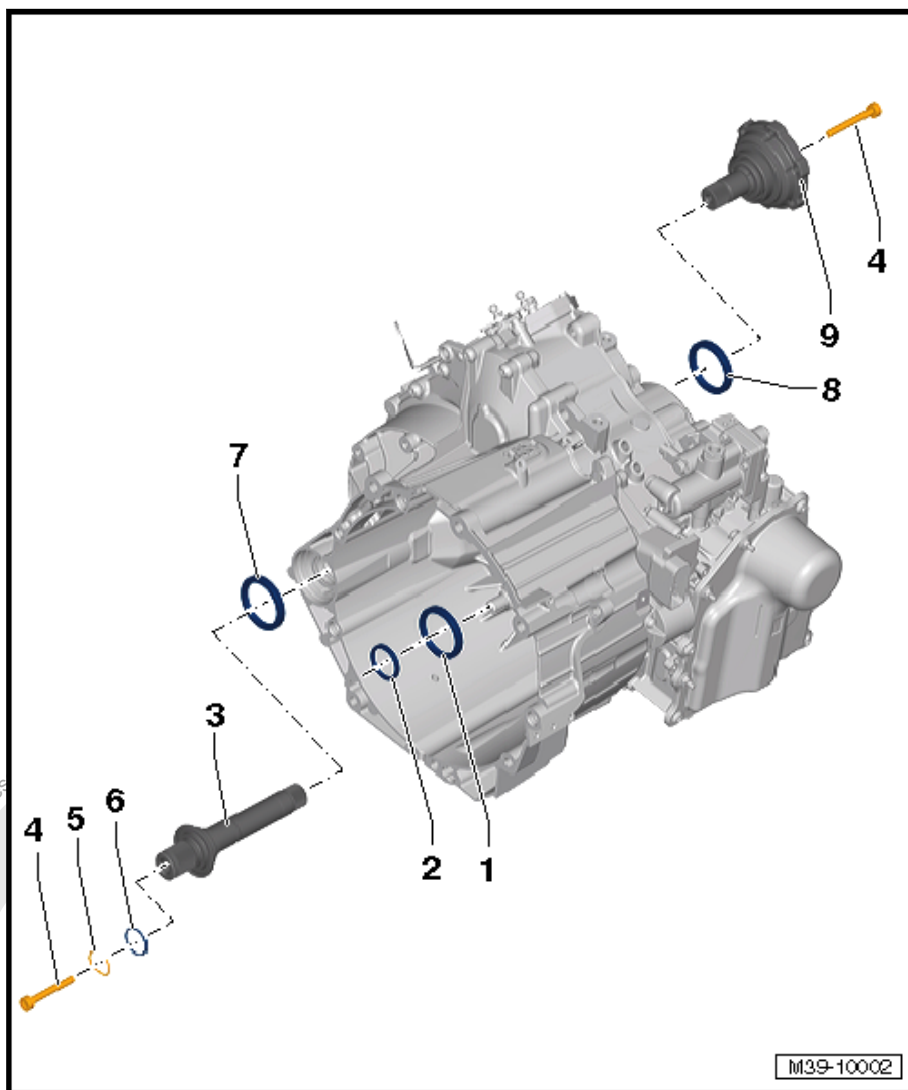
7 - Right Seal

- ❑ For the right stub shaft
- ❑ Always replace. Refer to ⇒ [“1.3 Right Seal, Replacing”, page 245](#)

8 - Left Seal

- ❑ For the left flange shaft
- ❑ Always replace. Refer to ⇒ [“1.2 Left Seal, Replacing”, page 242](#).

9 - Left Flange Shaft



1.2 Left Seal, Replacing

Special tools and workshop equipment required

- ◆ Slide Hammer Set - VW771-
- ◆ Seal Installer - Flange Shaft - 3305-
- ◆ Socket And Extended Bit - T10107A-
- ◆ Used Oil Collection and Extraction Unit - SMN372500-
- ◆ Sealing Grease - G 052 128 A1-

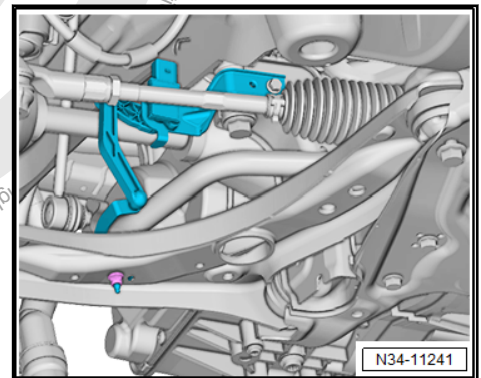


Removing

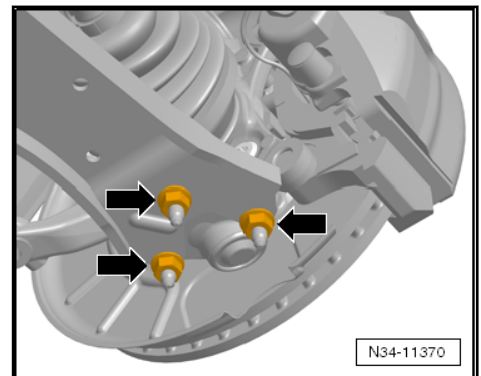


Note

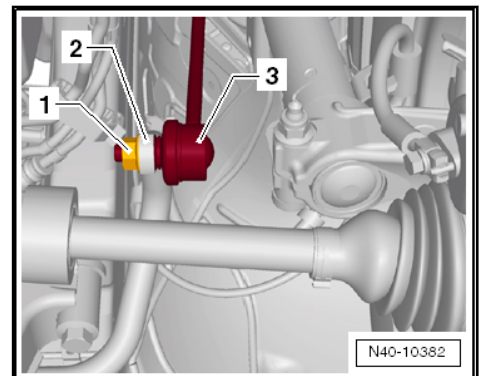
- ◆ Pay attention to ⇒ **"3 Repair Information", page 6**.
- ◆ Do not loosen the driveshaft bolts on the wheel bearing housing.
- Remove left front wheel.
- Remove the noise insulation below engine/transmission. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
- Remove the left front wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Front Wheel Housing Liner, Removing and Installing .
- If present: Remove the Left Front Level Control System Sensor - G78- from the control arm.
- Turn the steering wheel all the way to the left and remove the left drive axle from the flange shaft. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Driveshaft; Driveshaft, Removing and Installing .



- Remove only the left control arm from the ball joint -arrows-.
- Disengage the left ball joint from the control arm.



- Remove the nut -1- from the coupling rod -3-. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Subframe; Stabilizer Bar, Removing and Installing .
- Remove the coupling rod and turn the stabilizer bar -2- slightly upward.
- Move the left drive axle in the wheel housing.
- Tie the drive axle as high up as possible. Be careful not to damage the paint on the driveshaft.
- Place the Used Oil Collection and Extraction Unit - SMN372500- under the transmission.

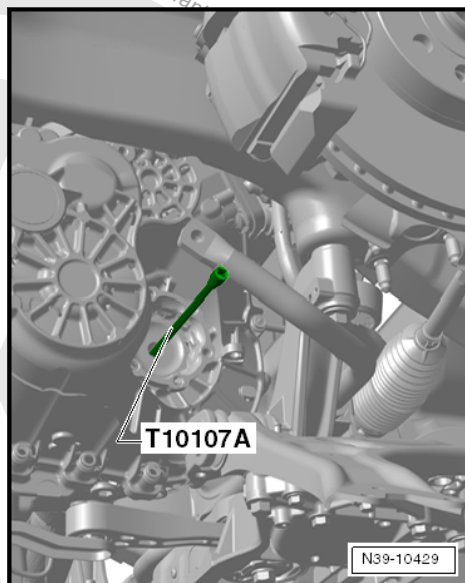




- Remove left flange shaft bolt by installing 2 bolts in flange and counter holding flange shaft with assembly lever.

The bolt has 6 mm inner hex. The bolt can also be removed and installed using a commercially available 6 mm socket.

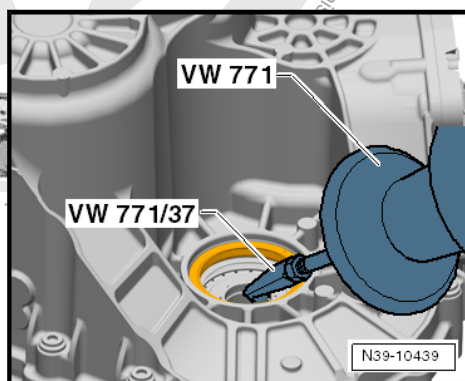
- Remove the flange shaft with spring, thrust washer and tapered ring.



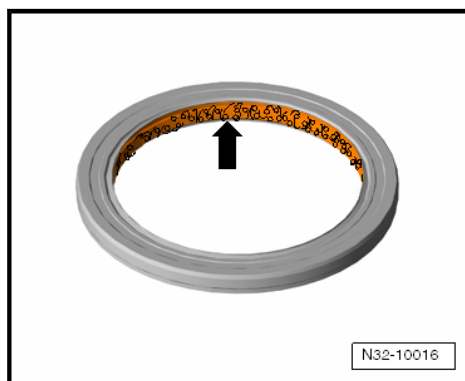
- Remove seal with Slide Hammer Set - VW771- and Slide Hammer Set - Hook - VW771/37.

Installing

Install in reverse order of removal. Note the following:

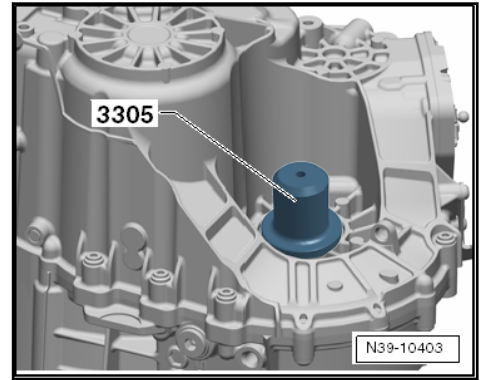


- Coat the outer circumference of the new seal with transmission fluid.
- Fill the space between the sealing and dust lip -arrow- half-way with Sealing Grease - G 052 128 A1- .





- Install the seal all the way without tilting it.
- Install the flange shaft.
- Tighten the flange shaft bolt to the tightening specification. Push the flange shaft against the transmission so that the bolt engages in the thread.
- Attach the drive axle to the flange shaft. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Driveshaft; Driveshaft, Removing and Installing .
- Attach the coupling rod and control arm. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Subframe; Stabilizer Bar, Removing and Installing .
- Refill any transmission fluid that may have leaked out while removing the seal. Refer to ⇒ [“9.1 Transmission Fluid, Draining and Filling”, page 153](#) .



Note

The transmission fluid must be replaced to assure the transmission fluid level is correct.

- Install the left front wheel housing liner. Refer to ⇒ Body Exterior; Rep. Gr. 66 ; Wheel Housing Liner; Front Wheel Housing Liner, Removing and Installing .
- Install the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .
- Install the wheel. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 44 ; Wheels, Tires; Wheel Bolts, Tightening Specifications .

Tightening Specifications

- ◆ Flange shaft to transmission. Refer to ⇒ [“1.1 Overview - Component Location Seals”, page 242](#) .

1.3 Right Seal, Replacing

Special tools and workshop equipment required

- ◆ Seal Installer - Flange Shaft - 3305-
- ◆ Socket And Extended Bit - T10107A-
- ◆ Used Oil Collection and Extraction Unit - SMN372500-
- ◆ Sealing Grease - G 052 128 A1-

Removing

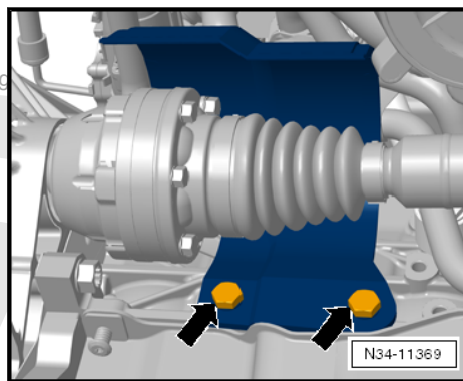
Note

Pay attention to ⇒ [“3 Repair Information”, page 6](#) .

- Remove the noise insulation below engine/transmission. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .



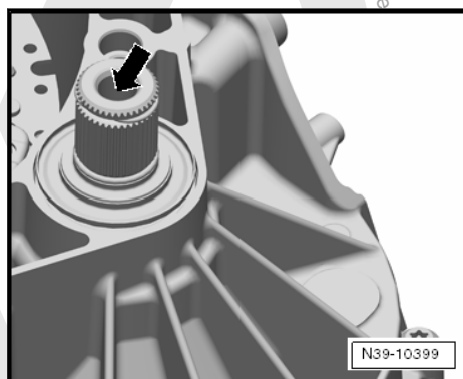
- Remove the right drive axle heat shield from the engine -arrows-.
- Remove the right drive axle. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Driveshaft; Driveshaft, Removing and Installing .
- Place the Used Oil Collection and Extraction Unit - SMN372500- under the transmission.
- Remove the bolt in the stub shaft with Socket And Extended Bit - T10107A- or a commercially available 6 mm socket.
- Remove the stub shaft.



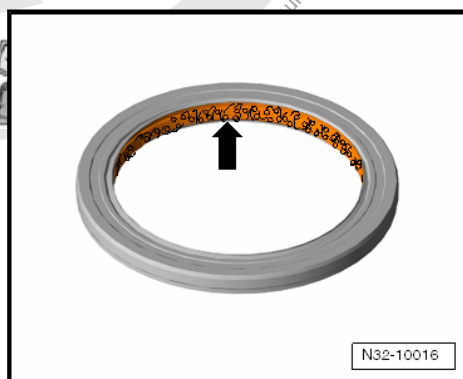
- Pry out the sealing ring.

Installing

Install in reverse order of removal. Note the following:



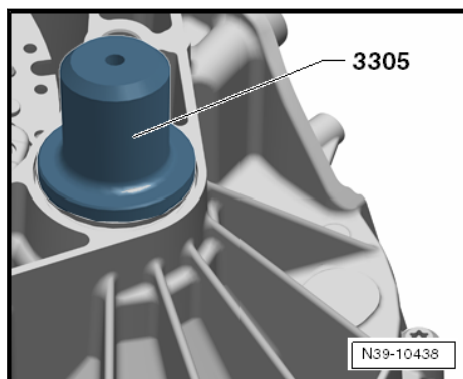
- Coat the outer circumference of the new seal with transmission fluid.
- Fill the space between the sealing and dust lip -arrow- half-way with Sealing Grease - G 052 128 A1- .



- Install the seal all the way in without tilting it.

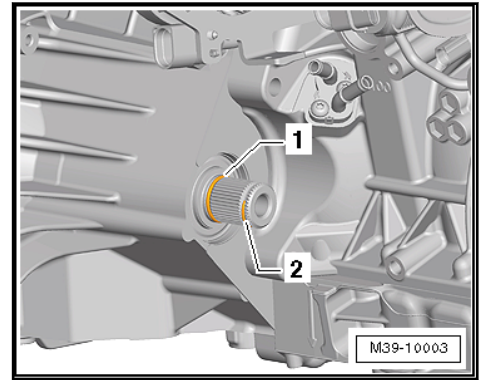
If necessary, install a new dust ring on the stub shaft using Press Piece - Trailing Arm - 2010- . Do not use a hammer.

- Insert the stub shaft.
- Tighten the bolt on the stub shaft to the tightening specification -item 4- ⇒ [Item 4 \(page 242\)](#) . Push the stub shaft against the transmission so that the bolt engages in the thread.





- Replace the O-ring -1- and locking ring -2- on the stub shaft.
- Install the right drive axle. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Driveshaft; Driveshaft, Removing and Installing .
- Install the heat shield over the right drive axle. Refer to ⇒ Suspension, Wheels, Steering; Rep. Gr. 40 ; Driveshaft; Driveshaft, Heat Shield, Removing and Installing .
- Refill any transmission fluid that may have leaked out while removing the seal. Refer to ⇒ [“9.1 Transmission Fluid, Draining and Filling”, page 153](#) .



Note

The transmission fluid must be replaced to assure the transmission fluid level is correct.

- Install the noise insulation. Refer to ⇒ Body Exterior; Rep. Gr. 50 ; Noise Insulation .

Tightening Specifications

- ◆ Stub shaft to the transmission. Refer to ⇒ [“1.1 Overview - Component Location Seals”, page 242](#) .

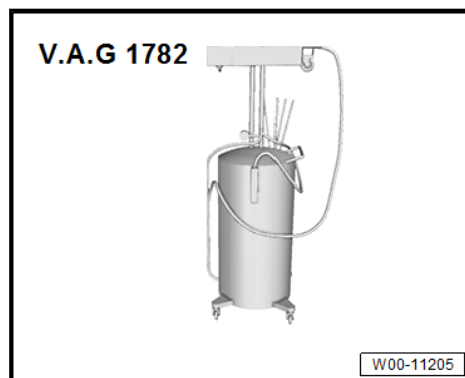




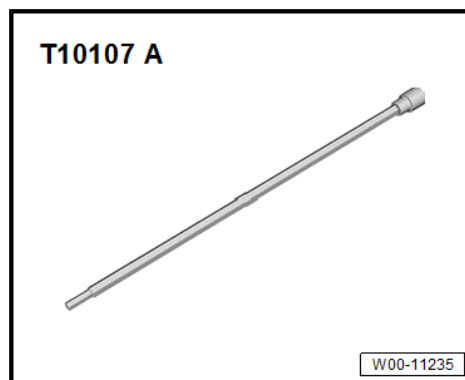
2 Special Tools

Special tools and workshop equipment required

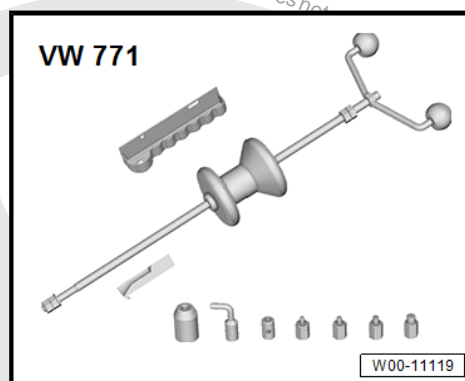
- ◆ Used Oil Collection and Extraction Unit - SMN372500-



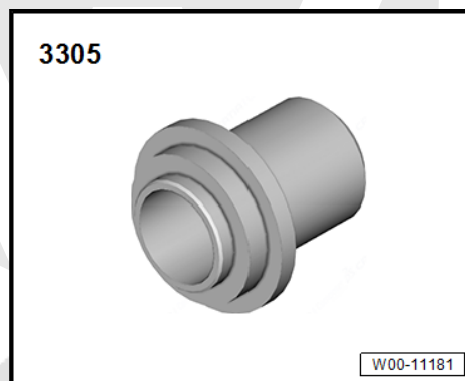
- ◆ Socket And Extended Bit - T10107A-



- ◆ Slide Hammer Set - VW771-



- ◆ Seal Installer - Flange Shaft - 3305-





3 Revision History

DRUCK NUMBER: K0059080521

Factory Edition	Edit Edition	Job Type	Feedback	Notes	Quality Checked By
02.2 019	01/3 1/20 24	Local Feed back	ABC 839 6	Removed 03 fluid capacities links in RG 00 Technical Data	Eric P.
02.2 019	01/0 5/20 24	Local Feed back	ABC 819 3	Removed 03 fluid capacities links.	Eric P.
02.2 019	05/2 9/20 19	Local Feed back	142 408 9	Added under "Engine Control Module" in the Transmission, Installing - in the Guided Fault Functions.	Eric P.
02.2 019	03/0 7/20 19	Factory Up-date	144 863	Changed replace if necessary to replace needle bearing in the Transmission, Installing procedure.	Eric P.
06.2 016	12/1 1/20 18	Cor-rec-tion		MRP removal process	Tom Perry
06.2 016	10/2 3/20 17	Local Feed back	129 095 7	Updated the mrp list in transmission removing procedure	Eric P.
06.2 016	10/0 6/20 17	Local Feed back	128 782 1	Removed O-ring from MRP list in the Mechatronic R&I, it now matches the overview.	Eric P.
06.2 016	07/2 4/20 17	Local Feed back	127 052 9	Added at least 30 ml to Mechatronic, R&I	Eric P.
06.2 016	05/2 5/20 16	Local Feed back	125 891 9	Fixed links in 34 Controls, Housing - Transmission, Removing	Eric P.
06.2 016	11/0 9/20 16	Local Feed back	121 260 9	Changed links in the Transmission Fluid, draining and Filling procedure table, from 2 rows to 1 row going to the fluid capacity table.	Eric P.
06.2 016	11/0 3/20 16	Cor-rec-tion	N/A	Remove two-digit model code; restructure u-kaps	Tom Perry
06.2 016	08/3 1/20 16	Cor-rec-tion	N/A		Tom Perry
06.2 016	08/1 9/20 16	Factory Up-date	N/A	Changed obergrup from transmission to drivetrain, plus factory updates	Eric P.



Fac- tory Edi- tion	Edit Edi- tion	Job Type	Fee dba ck	Notes	Quality Checke d By
01.2 016	05/0 6/20 16	Lo- cal Feed back	117 028 3	Fixed tool number T10323	J. Ca- gle
01.2 016	03/1 7/20 16	Fac- tory Up- date	N/A	Update to coincide with feedback 1147125	Tom Perry
08.2 014	01/2 6/20 16	Lo- cal Feed back	114 712 5	Added part numbers for K2 shims per factory	Eric P.
08.2 014	04/2 7/20 15	Lo- cal Feed back	109 413 4	Added that O-ring is inclu- ded only with pipe, and added washer to transfer statement	Eric P.
08.2 014	04/0 1/20 15	Lo- cal Feed back	108 795 0	Added torque spec	Eric P.
08.2 014	10/1 5/20 14	Lo- cal Feed back	104 041 8	Added steps per factory	Eric P.
08.2 014	8/7/2 014	Fac- tory Up- date w/ Feed back	103 785 8		Jim H.
N/A	6/23/ 2014	Feed back	101 199 4		Jim H.
N/A	6/17/ 2014	Feed back	101 465 4, 102 236 0		Eric P.

Cautions & Warnings

Please read these WARNINGS and CAUTIONS before proceeding with maintenance and repair work. You must answer that you have read and you understand these WARNINGS and CAUTIONS before you will be allowed to view this information.

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized Volkswagen retailer or other qualified shop. We especially urge you to consult an authorized Volkswagen retailer before beginning repairs on any vehicle that may still be covered wholly or in part by any of the extensive warranties issued by Volkswagen.
- Disconnect the battery negative terminal (ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.
- Volkswagen is constantly improving its vehicles and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only. Always check with your authorized Volkswagen retailer parts department for the latest information.
- Any time the battery has been disconnected on an automatic transmission vehicle, it will be necessary to reestablish Transmission Control Module (TCM) basic settings using the Volkswagen Factory Approved Scan Tool (ST).
- Never work under a lifted vehicle unless it is solidly supported on stands designed for the purpose. Do not support a vehicle on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never work under a vehicle that is supported solely by a jack. Never work under the vehicle while the engine is running.
- For vehicles equipped with an anti-theft radio, be sure of the correct radio activation code before disconnecting the battery or removing the radio. If the wrong code is entered when the power is restored, the radio may lock up and become inoperable, even if the correct code is used in a later attempt.
- If you are going to work under a vehicle on the ground, make sure that the ground is level. Block the wheels to keep the vehicle from rolling. Disconnect the battery negative terminal (ground strap) to prevent others from starting the vehicle while you are under it.
- Do not attempt to work on your vehicle if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset or have taken medicine or any other substances that may impair you or keep you from being fully alert.
- Never run the engine unless the work area is well ventilated. Carbon monoxide (CO) kills.
- Always observe good workshop practices. Wear goggles when you operate machine tools or work with acid. Wear goggles, gloves and other protective clothing whenever the job requires working with harmful substances.
- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.
- Do not re-use any fasteners that are worn or deformed in normal use. Some fasteners are designed to be used only once and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual - replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.

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- Illuminate the work area adequately but safely. Use a portable safety light for working inside or under the vehicle. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.
- Friction materials such as brake pads and clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.
- Finger rings should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.
- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly; do not attempt shortcuts. Use tools that are appropriate to the work and use only replacement parts meeting Volkswagen specifications. Makeshift tools, parts and procedures will not make good repairs.
- Catch draining fuel, oil or brake fluid in suitable containers. Do not use empty food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store the oily rags, which can ignite and burn spontaneously.
- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque listed.
- Keep sparks, lighted matches, and open flame away from the top of the battery. If escaping hydrogen gas is ignited, it will ignite gas trapped in the cells and cause the battery to explode.
- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond, or lake. Consult local ordinances that govern the disposal of wastes.
- The air-conditioning (A/C) system is filled with a chemical refrigerant that is hazardous. The A/C system should be serviced only by trained automotive service technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.
- Before doing any electrical welding on vehicles equipped with anti-lock brakes (ABS), disconnect the battery negative terminal (ground strap) and the ABS control module connector.
- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.
- When boost-charging the battery, first remove the fuses for the Engine Control Module (ECM), the Transmission Control Module (TCM), the ABS control module, and the trip computer. In cases where one or more of these components is not separately fused, disconnect the control module connector(s).
- Some of the vehicles covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag in the event of a frontal impact. The airbag is operated by an explosive device. Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious personal injury. To guard against personal injury or airbag system failure, only trained Volkswagen Service technicians should test, disassemble or service the airbag system.

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- Do not quick-charge the battery (for boost starting) for longer than one minute, and do not exceed 16.5 volts at the battery with the boosting cables attached. Wait at least one minute before boosting the battery a second time.
- Never use a test light to conduct electrical tests of the airbag system. The system must only be tested by trained Volkswagen Service technicians using the Volkswagen Factory Approved Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the vehicle.
- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.
- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.

I have read and I understand these Cautions and Warnings.